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ABSTRACT

This report chronicles key steps in the process of the development of a growing operational telecommunications system, ultimately capable of reaching even the smallest and most remote villages in Alaska, and discusses its applications and implications for improved educational support delivery statewide. There is particular emphasis on the experiments and planning funded in part or in full by the National Institute of Education since 1973. Part II is designed to serve as background documentation on Alaska's history of educational telecommunications development. Part III reports the tasks accomplished by the Governor's Office of Telecommunications and the Alaska Department of Education. The 4-year planning document prepared to establish an operational educational telecommunications system is detailed in Part IV. Appendices include the task force survey questionnaire with a summary of responses, the planning and research survey questionnaire with a task force, a resources/characteristics matrix, a summary of implementation possibilities, a simplified glossary of common telecommunications terms, and a bibliography. (VT)

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PLANNING TO MEET
ALASKA EDUCATIONAL NEEDS
THROUGH TELECOMMUNICATIONS

Final Report
January 31, 1977

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Richard Dowling

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC) AND
USERS OF THE ERIC SYSTEM."

Prepared under Contract No. 400-76-4005
for the National Institute of Education

By The State of Alaska
Office of the Governor
Office of Telecommunications

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I. INTRODUCTION

Forty percent of all Alaskans, and 60% of all the public schools in the State, are located in communities of less than 1,000 people, where the penalties of isolation are felt in terms of the quality and effectiveness of public and educational services that are readily available.

Half of the State's population and school-age children are centered in the three main urban areas: Anchorage, Juneau and Fairbanks, where the accessibility and reliability of public services, communications and education have been progressively developing for decades. Development of similar services to the remaining rural population has been more sporadic, hampered by technical, geographic and cost limitations imposed by the State's diverse terrain and climate.

Adequate communication has long been recognized as a crucial link from which to plan and provide equitable educational opportunities to all Alaskans, rural and urban. Many recent events have contributed to the development of a growing operational telecommunications system, ultimately capable of reaching even the smallest and most remote villages in Alaska.

This report will chronicle key steps in the process of that development, its applications and implications for improved educational support delivery statewide with particular emphasis on the experiments and planning funded, in part or in full since 1973, by the National Institute of Education. Part II is designed to serve as background documentation on Alaska's history of educational telecommunications development. Part III reports the tasks accomplished by the Governor's Office of Telecommunications (OT) and the Alaska Department of Education (DOE) under NIE contract #400-76-4005: "A Planning Document for Future Educational Satellite Experiments in Alaska."

The 4-year planning document prepared by DOE to establish an operational educational telecommunications system is detailed in Part IV.

This report has been prepared to fulfill the requirement for final contract reporting for NIE, but is also intended as a reading document for Alaskan educators interested in the evaluations of telecommunications in this State.

II. ALASKA'S ENTRY INTO EDUCATIONAL TELECOMMUNICATIONS

A. A BRIEF HISTORY: A Chronology of State Telecommunications Action with Implications for Education.

1968 Satellite communications has long been regarded in Alaska as the only viable, long-term solution to the development of adequate, reliable communication services statewide. As early as 1968, the state established a Satellite Task Force, whose objective was to determine the total requirements for all communications services now in existence within the State, and all projected services. Early planning included the Alaska Educational Broadcasting Commission (then known as the Alaska Public Broadcasting Authority), the Department of Education, the University of Alaska, and the Division of Communications/Department of Public Works.

1969 In late 1969, under the formal auspices of the Division of Communications, a formal proposal for "Satellite Communications Demonstration for Alaska" was submitted to NASA. National satellite experimentation provided the technical vehicle for two-way audio and (initially) video communication: the ATS-1 satellite.

1970 The first demonstration of ATS-1 began in April 1970, transmitting public radio programming between KUAC in Fairbanks and stations in the Lower 48. The experiments had begun.

In 1970, Alaska had the poorest operational telecommunications system of any state. The basic system had first been developed by the U.S. Department of Defense (DOD), the FAA, and the U.S. Coast Guard, with civilian traffic carried on a "time available" basis. Telephone service was rarely available beyond the larger communities; limited, populated areas could receive daytime radio broadcast; commercial television was broadcast or cabled in only the largest urban areas, and relied almost totally on week or month-old videotapes; the first educational television broadcast station was under construction.

1. UNESCO/NEA STUDY

One of the earliest studies addressing Alaska's educational communications needs was prepared in 1970, with the participation of NEA-Alaska.

A United Nations Educational, Scientific, and Cultural Organization - National Education Association (UNESCO-NEA) team traveled to Alaska to investigate the feasibility of using satellite communications to alleviate educational problems of the state. The team, Henry Cassirer of UNESCO, and Harold Wigren of NEA, concluded, in part:

"Satellite communications for Alaska, as part of an overall long-range educational communications system, are not only feasible but necessary for

improved communications in the State. In many respects, a satellite was "invented" for Alaska because of Alaska's unique communications problems, lack of terrestrial communications facilities, mountainous terrain, harsh climate and sparse population."¹

Cassirer and Wigren also concluded that, owing to the high cost of equipment required for television transmission and reception on NASA's ATS-1, television experiments should be postponed until "a later generation of satellites of the AST-F or ATS-G variety are available."

Later the same year, consultants George Hall and Frank Norwood, from the National Association of Educational Broadcasters, stated:

"Geographic and demographic conditions in Alaska require that the State make heavy, consistent, and systematic use of telecommunications processes to facilitate and extend the operation of educational, training and informational programs of all kinds. The exact determination of the precise telecommunications machinery (radio, television, videotape, teletype) to employ in a given activity must be determined situationally through a careful weighing of the means available and results desired."²

The Alaska Educational Broadcasting Commission (AEBC) concurred.

2. RCA ALASCOM

Also in 1970, the State's first commercial long-lines carrier, RCA-Alaska Communications (Alascom) purchased the DOD-operated Alaska Communications System (ACS), consisting of terrestrial links in several regions of the State, and began leasing portions of the Air Force-operated White Alice Communications System (WACS), allowing expansion of non-military service.

1971 The delivery of comprehensive and equitable support to all Alaskan schools was precluded not only by the isolation and distance between schools and school districts in the State, but also by the multiple management agencies. Three separate systems, with different governance and financing procedures, held responsibility for Alaskan schools. City and Borough school districts were governed by locally elected school boards and locally-appointed staff. Schools outside city and borough school district boundaries (rural schools and schools on military reservations) were under state jurisdiction in the Alaska State-operated School System, involving a total of 134 schools operated centrally out of

Anchorage. The Bureau of Indian Affairs (U.S. Department of Interior) managed over 50 elementary village schools, and regional high schools that required village students to relocate in an urban area.

3. HAMMET & EDISON STUDY/AEBC

The AEBC, within the Alaska Department of Education, with the help of the Ford Foundation, in 1971 commissioned a study to "recommend methods of making educational communications services available to all Alaskans."³

The authors talked with Alaskan teachers and residents, and found:

...A great demand for communications of all kinds, even minimal services. The study was then directed toward determining the least expensive and the most satisfactory ways to transmit audio and video programs throughout the state.⁴

This report concluded that while conventional broadcast could bring educational television and radio to 85% of the population, a satellite distribution system was the only feasible method for reaching the 15% of residents living more than 50-100 miles from a population center.

...The need for educational television network interconnections is only one of many Alaskan communications needs, spanning the entire spectrum of users and educational entities, as well as every individual who ever wants to place a personal telephone call...a multi-service satellite system is the logical answer.

...In summary, because of satellites, there appear to be no significant technical obstacles to the establishment of communications services in any desired variety and quantity in Alaska within five years. To obtain satisfactory service, the state must first decide what its goals are, then initiate concrete and informed discussions with suppliers, and be prepared to pay a reasonable price. Because of the unusual interconnection problems in Alaska, the state may have to take an unusually active part in defining requirements and leading suppliers to offer what is needed.⁵

The Federal Field Committee for Development Planning in Alaska, in its study Economic Outlook for Alaska: 1971, established poor communications as Alaska's primary inhibitor to social and economic development. Planning for the future of satellite communications within Alaska was becoming widely recognized as potentially the most viable means of providing eventual state-wide communications service. That same year

RCA first applied to the Federal Communications Commission (FCC) for authority to construct a series of satellites and earth stations to serve the Lower 48 and Alaska.

While studies were helping determine the available means for communications service, little data existed on educational communications needs, beyond the probable needs of educational broadcasting.

4. AETC ESTABLISHED

The AEBC still held prime authority for educational telecommunications development. In mid-1971 it created an Alaska Educational Telecommunications Consortium (AETC) to guide the ATS-1 project (now two-way voice only) and study and identify technical solutions to help solve rural educational problems.

5. ATS-1 SATELLITE EXPERIMENTS

In the fall of 1971, the Action Study of Educational Uses of Satellite Telecommunications in Remote Alaskan Communities was undertaken by the AEBC and AETC, to find and assess these needs. While major experiments were devoted to providing health and emergency service via ATS-1, the Action Study coordinated expanding satellite educational experiments.

Over the next few years, more than two dozen villages with no existing telephone or television service were involved in the interactive ATS-1 project. Program development involved the Action Study in coordination of close to 30 state agencies and organizations, including NEA-Alaska. Programming was varied, ranging from health aide training to Native legends and stories, teacher, administrator and classroom exchanges, direct village contact with library services, and reports from Native corporations.

Slightly over half of the villages able to participate did so consistently during the experiments. Reasons for non-involvement varied from community to community.

The Action Study was not successful in instituting educational broadcasting in a substantial number of classrooms. The major reasons for this were determined to be poor initial planning that did not allow for teacher involvement...and the failure to strongly support this objective.⁶

Initially, the project was plagued with technical problems and frequent schedule changes eventually solved, however, this had a substantial effect on the audience interest. The project began with carefully planned objectives for parents, students, teachers and administrators. The

findings of the experiment stressed the continued potential of achieving these desired objectives with further development and experimentation.

The weakest link seemed to be the lack of direct teacher involvement in designing programs for classroom use. Interestingly, the programs were most successful when someone in the village took responsibility for involving the village; that person was most often a teacher. Further use of satellite radio was recommended as an improved means of tying together school administration at every level in forums for discussing curriculum improvements and other problems; and the study suggested control groups between satellite and non-satellite schools to measure the effectiveness of classroom broadcast efforts.

1972 The Action Study, and ATS-1, began the effort of finding some answers about the kinds of educational programs the schools and villages really needed. Some specific lessons were learned: cross-cultural programs were not particularly popular, though specific regional or village-oriented programs were; a real need did exist for administrative links, tying village educators together; local and user involvement in program planning was essential to success and utilization.

The Action Study, possible because of ATS-1, was an experiment in an untested field; like most experiments, it came to an end. Most rural villages and schools were still without basic telephone communications, depending on unreliable HF radio to contact the outside world. Educational programming would require reliable rural delivery beyond a few widely scattered sites before its potential contribution to equitable educational opportunity could become statewide reality.

ATS-1 has remained in use in Alaska ever since, and became the crucial 2-way audio system during the later experiments with the ATS-6 satellite (covered in more detail further in this report). Continued ATS-1 use has been primarily medical, with occasional educational users, and has been coordinated by several native regional corporations serving specific cultural regions. NEA-Alaska remained an active user through 1975, coordinated two school-year experiments of monthly interactive forums, involving teachers and administrators in Alaska, Hawaii and the South Pacific.

Much work remained to be done on the technical aspect of communications services, and the specific educational communications needs of Alaska continued to be studied.

6. TELECONSULT STUDY/AEBC

Teleconsult's extensive study, submitted to the DHEW and NASA through the AEBC and the AETC in mid-1972, reported that, "The circumstances, particularly the cultural and physical isolation, of the rural Native population, are of course the principal challenge to educational telecommunications in Alaska."⁷

This study included an exploration of the persistent educational needs in Alaska, suggestions of specific programming areas and priorities to meet those needs, and an assessment of the "disparity between reality and anticipations" for the widely discussed potential of satellites to cure Alaska's communications ills.

The focus remained on audio and visual materials, distributed through a variety of means, including potential commercial satellite and public service transmission.

Some interesting concepts and suggestions emerged from this study, including:

- coordinating the development of educational technology under one state educational government entity, as a "commitment on the part of the state to the use of educational technology as a fundamental process through which education might be improved in Alaska."
- the consortium approach to funding design, production and delivery of educational programming.
- a trained village "advocate", able to operate all equipment within a "community receiving center", to establish a community viewing pattern, reduce the economic burden of purchasing equipment, and increase interest and participation in programs.
- the need to study the impact educational technology's electrical requirements would have on village power supplies.

In the programming area, priority needs were clarified: from Native culture, land claims and bilingual news programs to enhance self-identity, to teacher cultural orientation and on-going in-service training.

The study also explored rural education needs in early childhood, elementary, secondary, higher adult education, and professional training for teachers and other rural workers. Specific programs series and objectives were outlined in these key categories.

7. AST-F EXPERIMENT PLANNING

During 1972, the AEBC had prepared and submitted to the U.S. DHEW "A Proposal to Develop a Plan for Alaska's Unique and Innovative Education Demonstration Employing ATS-F", the yet-to-be-launched public service, experimental satellite able to relay video as well as audio. Planning money was awarded.

8. MINI-TV's

During the same year, the first "mini-TV's", local 10-watt transmitters, were purchased and installed by the AEBC in St. Paul, Unalaska, King Cove, Fort Yukon, and later, Sand Point. Each station, funded through a grant from the Corporation for Public Broadcasting (CPB), was operated by the village under a special FCC waiver, with public programming supplied on cassette tape by the AEBC.

9. OFFICE OF TELECOMMUNICATIONS ESTABLISHED

1973 While attention was being given to the educational needs experimental satellite communications could address, executive order created the Office of Telecommunications (OT) within the Governor's Office in January 1973. OT was created to provide the state with a focal point for communications policy development and liaison between the state's users and communications vendors. The state now had an established entity responsible to ensure the adequate development of cost-effective communications techniques to serve all state residents. The ultimate goal: adequate and reliable communication for all communities in Alaska with more than 25 residents year-round.

a. OT Assumes ATS-F Planning Role

In its second month of operation, OT took over project responsibility from the AEBC for ATS-F demonstration plans. Five months later formal federal supervision of the national ATS-F Demo shifted to the National Institute of Education/USDHEW.

b. ATS-F Objectives

OT's planning objectives for the state's participation in the education portion of the ATS-F Health/Education Telecommunications Demonstration (DemoHET) was:

To install and operate an experimental satellite communications system so that state planning and requirements for future operational communications systems could be grounded in actual experience....

Studies have been made to generate data for use in telecommunications planning, but more valuable information, based upon experience gained through tests and demonstrations which simulate operational systems, is needed...It is the users of a system that generate service requirements; no one else, regardless of knowledge, experience or authority, can accurately predict what the users will want... It is far better to obtain knowledge through experience before planning is completed rather than after the system is installed....

Experience gained in the ATS-1 program has contributed to the development of plans for these ATS-F programs. The data obtained through ATS-F will serve as part of the foundation for developing operational systems....

Alaska's objective is not to determine if a satellite is useful, but how the technology might be most effectively used.⁸

c. Project Development

What lessons had been learned and applied to the planning for ATS-F?

Perhaps most significantly, responsibility for telecommunications planning and policy was now centered in one state government entity, which, while not strictly educational, had the Governor's authority. And there was lead time, over a year and a half, for planning prior to the first broadcasts over ATS-F (scheduled for the fall of 1974).

The project was substantially scaled down from the first plans, due to technical problems and funding limitations, but still allowed a realistic demonstration of video transmission and two-way audio interaction (over ATS-1) in widely scattered village classrooms.

Close cooperation between OT and DOE from the earliest planning stage resulted in project focus on two instructional concerns. First, the desire to establish two-way communications between participating educators that approximated face-to-face communications as closely as possible. Second, the opportunity for "hands on" experience in live video/audio communication for a variety of users could be utilized to make sound planning decisions for an eventual state communications system.

The instructional programming to be carried by ATS-F focused on user-identified critical and educational needs and four specific experimental program series were selected: early childhood education, basic oral language development, health education, and teacher in-service training. Within the time-frame of ATS-F improved pupil performance was not the major concern, but ATS-F programming with specific objectives was seen as one step in achieving support for basic needs.

OT's management of the project was consistently process-oriented, a process that took its principal lessons from the earlier experiments and studies.

1974 Fifteen earth terminal sites were constructed in rural Alaskan communities, with an average population of less than 250. All participating communities and the four Native regional corporations represented within the satellite's footprint were asked to select members to a consumer committee for the instructional series. The committees met regularly, and were

responsible for input and approval of all program designs.

OT contracted with the Northwest Regional Educational Laboratory (NWREL), with experience in Alaska, to professionally script all instructional programs based on sound educational design. The public television station KUAC at the University of Alaska/Fairbanks campus was contracted to professionally produce all programs. As equipment began to be installed, utilization work began. OT hired a village resident part-time to be responsible for the equipment, report problems or failures, and record village use.

Programs in health education and language development were eventually funded, designed and produced. Transmission began in October, 1974, for the remainder of the school year. Each program included teacher manuals, and was followed on-air with an interaction session and on-camera teachers to reinforce the lessons.

In addition to the instructional programming, teacher in-service training was broadcast weekly, coordinated and developed by DOE; the viewer-defined programming component, with its own Native consumer committee, resulted in Alaska Native Magazine, an hour-long feature on current rural Alaskan events and issues that was produced by KUAC in Fairbanks, including live question and answer sessions with studio guests (additional ANM funding was provided by CPB). Other programs were prepared by the Alaska Department of Community and Regional Affairs (legislative report), the Alaska State Library (Community Library Training, incorporating the video as part of a correspondence training course), and the Alaska Department of Fish and Game (films).

d. Summary of Project Outcomes

Overall, the \$1.7 million project resulted in 100 hours of original television programming being designed, produced and broadcast. Instructional programs were available to 1200 rural school children K-5th grade, and 150 rural Alaskan educators. Additional programming was accessible to 9,000 Alaskan village residents, young and old, as well as the 50,000 residents of Fairbanks.

The results? Extensive evaluation was prepared by the Center for Northern Educational Research (CNER) at University of Alaska/Fairbanks for Practical Concepts, Inc. (PCI), which incorporated specific recommendations for future experiments, as did OT's final report on the project.

The creation of consumer committees formally incorporated user and viewer involvement in program decisions and design. Those directly involved in this process were enthusiastic, despite the difficulties, for the project to continue and improve. Utilization of the instructional programs still had a weak link, however, and varied widely in each classroom. The breakdown was most obvious where teachers had not been consumer committee participants, but were then asked to incorporate the lessons into their day-to-day classroom activities. Some remained enthusiastic and encouraging,

utilizing the programs regularly; some did not. An active and interested utilization aide made the difference in some villages, and proved an effective information link between program coordinators and villagers; some were less interested, reporting irregularly.

But OT had gained a critical hands-on experience with educational television for rural Alaska. Communities had been involved in planning, as had the Department of Education.

The process had helped to more clearly define OT's responsibilities and role. The essence of the task was synthesis, to combine technical capabilities with identified program and informational needs for all potential users of continuing or expanded services.

While ATS-6 (ATS-F prelaunch--ATS-6 postlaunch) allowed specific focus on interactive television, its instructional benefits remained unknown beyond the elementary level. The year's demonstration had come to an end; the antennas on the edge of the school playgrounds in the rural sites became only a reminder of the potentials for improved communications. But the groundwork had been laid for the next step: designing and implementing an operational system incorporated into the state's overall communications plan, and consequently permanent service.

10. BOEING STUDY

In 1974, Boeing Aerospace Co. was exploring potential uses and users for the NASA/Canadian owned CTS satellite scheduled to become operational in late 1975. Through OT, Boeing developed the "Telecommunicational User Alternatives Study", to turn attention from continued experiments to an assessment of state agency and rural user requirements in relation to proposed communications facilities.

While CTS use never became a realistically cost-effective alternative for Alaska, the study did help clarify some specific technical communications vehicles for meeting DOE and State Library needs combining applications of one-way video, two-way voice, teleconferencing, facsimile and computer-assisted instruction.

This study clearly outlined potential technical systems, as well as the potential impact and change educational technology might impose. One conclusion, amidst the long-range view:

" (the time and planning required for full implementation) means that the audio lecture, video lecture or video conference will dominate the early implementation of telecommunications."

11. PROJECT WALES

Another interesting report published in August of 1974 provides

specific data on the introduction of television to a rural Alaskan village. The APUC and the University of Alaska installed a 2-channel cable distribution system in the village of Wales, with 130 permanent residents. Programs were broadcast March-August 1973; on the educational channel from 2:00-5:30 p.m.; on the commercial channel from 4:00-8:00 p.m. daily. The people of Wales agreed to participate, handled the mailed videotapes and used the provided television sets. Since distribution via cable at the village end could be a compatible local delivery means for satellite television, the implications of this project are significant here.

Project Wales Director, James R. Hendershot, summarized the findings of the project:

...Village school children showed significant improvement in certain aspects of auditory information processing as compared to children in a control village (Deering)...The shortness of the television test period makes the data from the children remarkable. It is our opinion that continued exposure to television would enhance the effects we found....

...Generally, we found that educational television tended to be watched only when commercial programming was unavailable. Viewing patterns for families within the village were fairly similar....

During the course of the television period, we discovered that informal social activities such as visiting patterns were not much altered by the presence of TV, but formal activities suffered. In general, the data suggests that when a social activity must compete with television, television wins.

The possible effects of long-term exposure to television are difficult to access (and) may depend on programming content. Some kinds of programming may reinforce traditional values and other kinds may weaken it...Television may leave its viewers better equipped to deal with the modern world.

...A great variety of factors currently are operating on the social systems of rural Alaskan villages and these forces must provide the framework for evaluating television. TV is a natural medium for presenting Native language programs, land claims information and the like. Through installations such as the one in Wales, this kind of influence could be felt around the state.¹⁰

Given the continuing development in all aspects of telecommunications, the following conclusion of the Project Wales Report has special interest for the increasing state commitment to involve rural people in planning the services to be provided them:

As to whether the end result of introducing television in rural areas of the state is good or bad is certainly beyond the scope of this study and in some ways a trivial issue.

Television will come to most communities in the state. The decision as to whether, or when, a particular village should have television (or electricity, a water system, sewers, or an airport), it seems to us, should be based on only two considerations. Is it in any way economically feasible, and do the people of the village want it?

At any rate, it is not impossible in these times to feel that television might well make the village--for many people--the best of all worlds. The rural village of the future could share some of the many advantages of an urban life style while maintaining a close tie with the way of living having its roots in tradition.¹¹

While ATS-6 was nearing its first broadcast in 1974, events on the technical front directly involved OT in a long-range assessment of the total communications needs in Alaska.

While most populated areas of the state had telephone communication by a combination of services in 1974, 108 rural communities still did not. RCA Alascom had initiated a "bushphone" program to some smaller communities, providing one VHF voice circuit with varying degrees of reliability. Terrestrial facilities continued gradually to expand.

12. RCA'S 1974-1980 PLAN

At the request of the Governor, RCA Alascom prepared a comprehensive plan for communication facilities and services through 1980. Over the next six years, the plan called for improvement in existing systems, with construction of a variety of earth stations, to provide voice communications, and eventually television, to all Alaskan communities. The state took formal exception to this plan, concluding that less expensive alternatives were possible.

1975 The state's concern for the inadequacies of RCA Alascom's proposed service, and the consequent cost that would have to be paid by state users was reinforced by the newly-elected Governor, and supported by both houses of the legislature. The disagreement reached to the FCC.

13. SMALL EARTH STATION PROGRAM

Subsequently, modifications were made in RCA's system plans. In May, the legislature took action with intent to allow development of an appropriate and cost-effective communications system for Alaskan rural residents, by appropriating \$5 million for the Earth Station Procurement Program. The project called for state purchase of 100 small (15-foot) earth stations for rural Alaska.

As a result of negotiations, an agreement was reached in July 1975: the state would purchase the equipment, and RCA Alascom would install and operate it. Construction of the first 20 stations, supplying one

medical/emergency telephone, and one public telephone through each earth station began in late 1975. With an upgrade in equipment, each station is capable of increasing the number of voice channels, as well as receiving television. In December, RCA launched its first satellite (F-1) followed in early 1976 by the second (F-2). Satellite long-distance intra and interstate traffic is now carried by F-2.

14. DOE'S PLANNING

By April 1975, DOE's Office of Planning & Research had completed "A Technology Based Educational System For Rural Alaska", a proposal outlining model systems for individualized instruction in remote areas, disseminating information and materials statewide; staff training models; and systematic integration of telecommunications for educational users. The emphasis within this proposal was on coordinating and integrating the educational needs, communications technology, and the management required to implement telecommunications development within existing educational programs.

By July, the dissemination portion of this original proposal became an NIE-funded project unto itself: the Alaskan Talent, Information and Promising Practices (Project A-TIP).

B. SUMMARY

Where did things stand in mid-1975? The state, through OT, was an active participant in building a comprehensive communications system for the remaining rural areas unserved by terrestrial facilities. Satellite relay was becoming an increasingly integral part of RCA's overall communications picture in Alaska. Legislative attention remained on the quality and capacity of the developing system, through the year-old telecommunications sub-committee within the Legislative Council.

Twenty-two local telephone franchises were providing full local and long distance service to 50% of the state's population. An estimated 90% of the population could receive at least one of the 18 commercial or 6 public broadcast radio stations regularly. Five more public stations were in the works as well as plans for a state-wide public radio network. Television could be received by over 85% of Alaska's residents, through the 7 commercial, 3 public and 15 cable Armed Forces (AFRTN) outlets. With coordination by the AEBC, the number of mini-TV outlets had increased to 10, including the school district owned and operated station in Yakutat.

Daily public educational television in Anchorage included two hours of instructional programs in conjunction with the Anchorage school district. Bethel's public broadcasting included daily instructional programs (some in Yupik Eskimo) through the Kuskokwim Community College and an expanding translator system to reach most villages in the lower Kuskokwim area.

The ATS-6 experiment had actively involved OT in planning cooperatively

with educational agencies in the state, particularly DOE. OT's staff had expanded during ATS-6, to include experienced educational media specialists and community liaison workers.

Even prior to completion of the NIE-funded demonstration, OT and DOE staff began looking to the need for continued planning and policy development for all state agencies and users. FY 1976 offered several key developments giving direction to this planning effort. One was the successful negotiation and start-up of the state-supported small earth station program, providing an operational satellite communication system for rural Alaska. Another was preparation for the decentralization of rural education through the disbanding of the Alaska State-Operated School System. Twenty-one new rural school districts were created, with newly-elected local school boards and community advisory committees, with full responsibility beginning July 1, 1976. In addition, planning began for eventual turn-over of BIA schools to the new rural districts. The supervisory fragmentation, so long a fact of educational life in Alaska, was ending, with DOE to become the key administrative and technical assistance office to support the state's (now) 52 separate school districts.

FOOTNOTES

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III. CONTINUED PLANNING EFFORTS

A. PREPARATION OF PLANNING PROPOSAL

The ATS-6 demonstration was a first major step toward defining Alaska's educational communications needs with specific concentration on the medium of interactive video. The momentum had been created, both for technical systems designers, educational planners and educational users to take the next step together: an in-depth realistic assessment of educational needs and the technical alternatives of an operational communications system to meet those needs.

The result was a planning grant proposal prepared by OT, in cooperation with DOE, and first submitted to the National Institute of Education/HEW in March, 1975.

In essence, the proposed planning was to be a continuation of the effort begun with ATS-6.

In OT's view, the activities conducted during ATS-6 were not nearly as important as the processes engaged in by Alaskans in utilizing a satellite system. With no service comparable to ATS-6, OT sought to continue that process of providing users with a foundation from which to base planning, user involvement and user acceptance of future permanent systems. The proposal included rural community needs in planning involvement and local management thru continuing the successes of the consumer committee concept from ATS-6.

Systems and materials design for educational users would concentrate within DOE, as a model state agency, and involve detailed process steps for design consortiums involving participants from a wide cross-section of the educational community, statewide. The result would be a cost-effective design model for technological application integrated with educational needs.

B. PROPOSAL MODIFICATIONS

A series of proposed revisions were necessitated by the reduced federal funding available to NIE, and the further clarification of OT's role in educational communications planning.

In August 1975 "A Revised Plan for an Alaskan Telecommunications Distribution System: Part of a Larger Problem (Building Upon Alaska's ATS-6 Experience)," was submitted to NIE, projecting planning efforts thru FY 1979. One option then appeared to be future experiments with ATS-6. (In FY 76, ATS-6 was in use in India, but would return to the U.S. in FY 77).

Key proposal focus was on:

- developing information for on-going community involvement as a basis for community decision-making, coordinated with educational consumer committees including local educators, local school board members and parents.
- technical implementation information of a "model design" for community telecommunications will be prepared for interested village and regional user groups, from which informed community decisions can be made.
- develop systems design and operation information available to state agency users, with DOE as a model user.
- specific dimensions of evaluation include:
 1. cost-effectiveness of the system.
 2. student, teacher and administrator satisfaction with the system.
 3. the integration of educational programs throughout the state.

Revisions following through the fall, while not reducing funding levels, continued to specify the detailed, desired outcomes of OT/DOE planning, and actively involved DOE personnel in these specifications. Grant authority was received from NIE in mid-November, 1975, for a plan fully endorsed by the Director of OT and the Commissioner of Education, establishing a contract for "A Planning Document for Future Educational Satellite Experiments in Alaska."

C. PROPOSAL OBJECTIVES

The major objectives remained:

1. To identify uses of modern telecommunications systems of interest to educational agencies within the state and provide information on how to plan, budget and implement such uses.
2. Establish on-going community involvement to provide a basis for local management and control of educational telecommunications systems and services.
3. Plan and design educational community telecommunications distribution systems.
4. Establish system of active public education and information distribution to serve as basis for user-defined educational telecommunications needs.

D. TASK OUTLINE

OT would work closely with DOE because, "while most state agency interest in telecommunications centers around its applications to public education and information, DOE's demands for telecommunications services are more likely than almost any other agency's to span the broad spectrum of use, from simple narrowband communications to broadband full-motion and other related activities."

The scope of OT's work as outlined in this new planning document focused on DOE and several key tasks. DOE would appoint a task force of Department personnel, so that DOE's user needs and program applications would give direction and definition to OT's efforts. Systems design work would start with the basics--through video-based information packages developed by OT and the DOE task force.

The first package ("Product 1") "shall be designed to provide DOE staff personnel with an overview of satellite telecommunications and the spectrum of capabilities of such a network."

"Product 2 shall be designed to provide an in-depth study of particular communications services that are directly relevant and applicable to Alaskan educational needs."

A consumer committee established through Native regional non-profit corporations, would include local educators, school board members and parents, and play an important role in information distribution, and local involvement in the overall educational systems planning.

IV. PRODUCT-ORIENTED INFORMATION LIAISON WITH DOE

A. ESTABLISHMENT OF DOE TASK FORCE

The working relationship developed between OT and DOE Office of Planning and Research during ATS-6 continued upon completion of the demonstration, and was heightened during the cooperative effort of preparing the planning proposal. The contract called for an OT/DOE working effort, focused on the development of information packages. Based on this orientation by OT, DOE would assume full project and continued proposal preparation responsibility as of July 1, 1976. The following timetable established resulted in the following schedule of meetings:

August 1-September	DOE Task Force formed.
September 17	TF orientation meeting with OT.
September 18, 22 & October 3	OT orientation meetings with DOE.
September 30	DOE Planning & Research assumes official telecommunications responsibility within DOE.
October 16, 22 & December 1, 11, 8 & January 8, 9, 14	TF and staff meetings for design of Product 1.
February 4, 1976	Product 1 completed and approved.
March 10 & April 5, 13, 15, 16, 20 & May 4, 17, 24, 25 December 3, 9	TF and staff meetings for design of Product 2.
June 18	Produce 2 completed and approved.
July 1, 1976	Project responsibility assumed by DOE.

Even prior to formal approval of the planning grant, DOE's coordinator of the Office of Planning and Research, Ernest Polley, had begun the establishment of a DOE Telecommunications Task Force. A preliminary orientation meeting was held September 17, 1975, with task force members and Chairman Polley. A questionnaire (Appendix 1 and 2) distributed by OT indicated that most members were modest in rating their overall knowledge of telecommunications and its terminology, yet saw potential for technology contributing as an instructional tool in a variety of basic educational areas. (Specific services rendered identified correlated closely with the member's job tasks and areas of educational concern, i.e.,

federal programs staff saw vital contribution in areas of technical assistance and consultation to districts).

Discussions continued over DOE and OT's roles and responsibilities in the planning effort. On September 30, 1975, the relationship was formalized with a Polley memo to OT accepting project responsibility: "For the balance of this year and for FY 77 the Office of Planning and Research shall serve as the DOE's focus for telecommunications systems planning."

1. MEMBERSHIP

DOE continued to expand task force membership, and the expanded task force, including virtually all DOE Divisions, convened its first meeting October 16, 1975. (Membership list in Appendix 3).

2. GOALS/TASKS ACCOMPLISHED

With representatives from every program division within DOE, the task force defined its goals and function. As a result of the year's planning effort, this working group would provide major input to DOE for telecommunications use policy decisions. Members would also be expected to keep their various divisions informed of telecommunications developments, and to remain active information liaisons within the Department.

Planning and Research interests also extended to the model computer assisted instruction (CAI) experiment instituted in an elementary Juneau school, and its implications for other districts. In addition, several working sessions with Planning and Research staff and OT covered the developing computer system at the University of Alaska, its implications for rural users, as well as the packet contention software and mode of multiplexing for serving networks of rural users which U of A was pursuing through a proposal to the National Science Foundation.

The task force began an extensive work schedule in November to the projects timelines. The first task was design and production of Product 1, to be finished by January 30.

3. PRODUCT 1

a. Needs Determination

This first information package would include two parts, a written report and a videotaped summary, to provide Department personnel with an understanding of overall satellite technology and capabilities.

At task force direction, the information was to be option-oriented, rather than specific.

A total of seven meetings for consistent monitoring and review of OT's design of the material in Product 1 were held between December 1

and early February 1977.

The approved outline for Product 1 "Educational Telecommunications Alternatives for Alaska" included a description of the principles of satellite technology, and the specific operation (with potential applications) in five basic categories: one and two-way audio hard copy transfer, data video and video/audio. Possible transmission configurations were suggested to clarify capacities, and where known, comparative cost figures were given.

b. Product Content

Tables 1 and 2 of this report (Appendix 4 and 5) summarize the informational content of the system requirements presented in the Product, both written and video, as well as an indication of implementation possibilities. A glossary of basic communications terms was prepared (Appendix 6), as was a bibliography for additional reference (Appendix 7).

The information was summarized for visual presentation, relying on graphics, slides, demonstrations and narration. The video summarized a discussion between Commissioner of Education Marshall Lind and the Director of the Office of Telecommunications, Robert Walp, on the importance of the educational implications of the suggested technical systems.

Primary task force input concentrated on the establishment of a consistent viewpoint giving the materials the widest possible distribution to educators. While travel schedules interfered with most members attendance at every meeting, attendance was still regularly high. And Polley held to the original commitment that all OT's timelines would be met: decisions were made when required, despite absences.

On February 10, Product 1 was officially accepted by DOE:

"...your staff has developed a product of substantial value. In addition, you and your staff have my most sincere appreciation for the high level of coordination evidenced to date." (Polley memo to Walp 2/10/76)

The written report was published in booklet form by DOE in March, and OT supplied 30 3/4" video cassette copies of the video.

c. Dissemination

During the next two months, Product 1 video was shown to the State Board of Education, the Education Committee of the Alaska Legislature, ABE/Legislative Subcommittee Joint Meeting, an educational fraternity (at the request of Commissioner Lind), two divisional meetings within the Department, and made available to interested districts, along with the written publication.

As an additional information effort, in February 1976 a DOE

Publications and Information staff member prepared a 4-part series on telecommunication for the state's newspapers exploring the educational possibilities. In March, OT produced a 28-minute videotape "Choosing Alaska's Communications Future", designed for general public education, describing general satellite technology, the small earth station installation and capabilities, and the educational planning underway within DOE. This tape was distributed to all TV broadcast and cable outlets in early April, and was available to schools and individual communities through the State Library's videotape and film distribution services.

In March, DOE's growing commitment of time and resources to telecommunications planning resulted in task force discussion of the continuation planning with NIE upon completion of the work with OT. As a result of this concern and need for clarification prior to further planning, Task Force Co-Chairman Polley met with NIE in Washington, D.C. March 30.

4. PRODUCT 2

a. Needs Determination

During the task force design work with Product 1, attention was also being given to a categorization of probable needs, the task force and DOE input required for the design of Product 2.

Nine meetings held in April gave definition to Product 2 design.

The task force compiled a working list of acknowledged and persistent statewide educational needs.

1. Increase variety and availability of individual learning programs.
2. Increase variety and availability of instructional materials.
3. Diagnosis and remediation of learning problems.
4. Individualized staff training.
5. Materials support for student test assessment.
6. Disseminate information on promising programs and practices statewide.
7. Increase access to general education information.
8. Establish easier system of school/DOE reporting and communications.
9. Provide means for simple, informal contact with other teachers.
10. Expand curriculum/instructional offerings.

11. Improve communication between school boards.

12. Improve access and input procedures of Talent Bank.

At OT's suggestion, task force approval was given to the conceptualization of the second information package as highly interactive and problem-orientated, providing means for reviewer response.

OT, with task force representative's assistance, conducted interviews with key Department divisions over the next 3 weeks to gain a working background of DOE's determination of needs. Sessions were held with staffs of Education Program Support, Planning and Research, Federal Program, Correspondence Study, Adult Basic Education, Fire Service Training, and the State Library.

As a result of this input, OT compiled, with task force approval April 20, a summary of critical categories, and specific applications to serve as the basic design for Product 2. (Appendix 8)

May 25, Polley reported to task force members that a recent phone conversation with Dr. Grayson at NIE had resulted in the following understanding. The preliminary proposal for an operational and implementation design would be due October 1 with NIE response by November 1; the final plan was due January 15, 1977; notification of acceptance or rejection by NIE would be forthcoming by mid-February, 1977; and if accepted, a contract would be awarded by mid-March (Polley memo to TF 5/25/76).

b. Product Content

By the end of May, drafts for Product 2 had been approved by the task force. The needs determination had resulted in the specific applications detailed within four categories of need:

1. Instructional Resources & Programming
2. Staff Development
3. Information Exchange
4. Management

Product 2 contained "Problem/Solution" demonstration of the applicability of telecommunications for solving specific existing problems. The basic design also incorporated role-played discussions after each of the four categories, exploring both the pros and cons of the applications proposed.

At Task Force direction, a questionnaire was also approved to accompany both the written and video portions of Product 2, to encourage viewer/reader reaction and prioritization of needs in the critical categories.

c. Dissemination

The finished video and written Product 2 were reviewed and approved in mid-June. It was strong task force consensus that viewing of the tape would be most effective if performed by a trained presenter, capable of soliciting maximum response for viewing educators.

The written portion of Product 2 was prepared for printing in late July, in tabloid newspaper form, with illustrations incorporating key issues of the "role-playing" video segments. Six thousand copies were printed and received by DOE early in August.

Copies of all products were contributed to the Alaska State Library for incorporation into materials catalogs and by-mail circulation upon request.

With completion of Products 1 and 2, the major planning and information preparation outlined under OT's contract with NIE had been completed.

B. RURAL EDUCATIONAL TELECOMMUNICATIONS COMMITTEE

An additional component of the planning grant included OT's responsibility for establishing and utilizing a committee composed of rural educators and parents during the planning phase of the work with DOE.

1. MEMBERSHIP

In early 1976, OT contacted non-profit regional corporations and, at the suggestion of the Alaska Federation of Natives (AFN), the Rural Education Attendance Area (REAA) School Boards, and Rural Community Action Program (RurALCAP), to select regional representatives to serve on the educational telecommunications committee. Interested rural residents were then selected. (Membership list in Appendix 9)

2. GOALS

In utilizing the committee in conjunction with DOE Task Force and OT planning, the two agencies established their responsibilities to the committee, and the committee's role within this planning process. (See Appendix 10) The committee confirmed these outlined responsibilities.

3. TASKS ACCOMPLISHED

During the remainder of 1976, four meetings were held with the committee, funded in-full under the NIE contract with OT. All meetings were held in Anchorage:

March 30-April 1, 1976	Orientation; discussion of goals and tasks and committee's role in NIE planning project; review of Product 1.
May 6-7	Continued orientation; preview of Product 2 design; discussion with Univ. of Alaska/Rural Education Affairs, Center for Northern Educational Research, UOA; IBM Marketing; and Ernest Polley, DOE.
August 5-6	Preview Product 2 and distribution plan; DOE's developing proposal; small earth station project, and education planning timelines.
November 11	Review Product 2 and committee recommendations; review of user alternatives survey; discussion of Satellite Television Demonstration.

Turn-over on the committee was fairly high, and weather restricted attendance occasionally. Overall, the committee was eager to participate; curious and interested in the statewide development and educational implications, and, at its final meeting, confirmed the process and plans being developed by OT and DOE.

The Committee provided DOE and OT with a means of disseminating information and getting feedback on the planning effort directly from rural residents, all of whom were active in local or regional educational programs. The information provided members during the meetings became a direct source of soliciting user feedback, and most members were active and made this information available in their communities. Specific recommendations and changes suggested by the committee were incorporated into the information packages. All members expressed interest in keeping informed of their school district's involvement with developing telecommunications systems and programming, and in pursuing potential regional or village involvement in various aspects of educational communications development.

V. OPERATIONAL SYSTEM PROPOSAL

A. PROPOSAL DEVELOPMENT PROCESS

1. DOE ASSUMPTION OF PROJECT RESPONSIBILITY

The development of the operational system proposal became the responsibility of the Alaska Department of Education on July 1, 1976. The proposal development effort at DOE was directed by Ernest Polley, Coordinator of Planning and Research and made possible by an \$85,000 grant from the Alaska Legislature. The main participants in the proposal development process were the Design Team, User's Group, and the Design Subcontractor, the Northwest Regional Educational Laboratory. These participants are described in some detail in the following sections of the report. The Office of Telecommunications participation in the development of the proposal was primarily through participation in the design team and through providing technical information as called for by the design subcontractor.

The proposal for a four and a half year project, eventually entitled, "Educational Telecommunications for Alaska", was developed during the period July 1976-January 1977. The process of proposal development consisted of the following general steps.

July 1, 1976	Awarding of contract to the Design Subcommittee.
July-August, 1976	Establishment of design parameters.
September, 1976	Development and User Group review of the preliminary proposal.
October 1-November 15, 1976	NIE review of initial proposal.
November 16-17, 1976	NIE feedback on initial proposal.
November 18, 1976 - January 15, 1977	Revision and rewrite of final proposal.

Function of each of the major participants in each of the steps of proposal development is described in the subsequent sections of this report.

The management of the proposal development effort was the responsibility of Ernest Polley of the DOE. The Design Team was a working group, charged with the responsibility of providing the design parameters, overall direction, and pertinent information to the design subcontractor. The User's Group was largely a representative group of executive level Alaska educators which was to react and respond to the proposal in whole, with particular attention paid to the consumer control mechanisms and management process. The proposal development subcontractor, the Northwest Regional Educational

Laboratory, was responsible for the actual production of the three required drafts of the telecommunications proposal. The subcontractor, with membership on the design team, was responsible to DOE, worked with the advice and assistance of the design team, and incorporated the reactions and suggestions of the User's Group in the development and revision of the proposal.

2. DETERMINATION OF NEEDS

The determination of the educational needs to be addressed in the proposed telecommunications project included two distinct studies. These were:

- (a) The Department of Education Planning and Evaluation Survey.
- (b) The Telecommunications Alternatives Survey.

In addition, the design team considered other relevant information (e.g., the implications of recent legislation affecting rural secondary education) in determining the final list of needs to be addressed to the proposal.

The Department of Education Planning and Evaluation Survey was conducted in the spring of 1976. The study served the broader purpose of establishing for DOE priority areas of educational need requiring departmental attention. However, the results also furnished valuable, and otherwise unobtainable, needs data required for the development of the telecommunications proposal. The data were responses to 69 Likert items and two open ended questions on a questionnaire distributed to over two thousand Alaskan educators. The Likert items asked the respondents to rate the importance of specific areas within four broad domains of concern: What services should the DOE provide?; How should the DOE provide services?; What problems have you had in working with the DOE?; and What areas should the DOE support? A total of 860 completed surveys were returned (36 percent of those mailed). Of those returned, 77.7 percent were from teachers, 14.3 percent from principals and principal-teachers and less than 3.5 percent from specialists. The results are presented and DOE priorities suggested in a DOE report "Results of Department of Education Planning and Evaluation Survey", 1976. These results are summarized in a subsequent section of this report.

The Telecommunications Alternatives Survey was conducted in September-November 1976 and reported on November 10, 1976. The study was confirmatory in nature in that the needs addressed by the proposed telecommunications project had already been determined by the design group. There were two strategies of data collection employed in this study.

First, the tabloid "Telecommunications and the Future of Alaskan Education" and an associated response sheet were mailed to 6,000 Alaskan educators in September 1976. The educators were encouraged to complete and return the response sheet by mail (postage prepaid). The tabloid and response sheet (with accompanying videotape) comprise Product 2 developed

by OT under this same NIE contract. The parallel videotape and tabloid explain the telecommunications alternatives available, present some possible telecommunications solutions to educational problems, and ask the educators to rate and comment upon the importance of telecommunications in providing solutions to educational problems they might encounter. For example, the questions deal with getting resource material, expanding courses and curriculum, earning recertification credits, delivery of instructional programs, staff development, computerized reporting records, and so forth. Open ended items encourage the respondents to identify other areas of frustration or need which might be addressed by telecommunications.

The second strategy of data collection involved presentations before local boards of education and several meetings of Alaska educators during September-November, 1976. The presentations, which more importantly served to inform key educators about the proposed telecommunications project, provided an opportunity for the distribution of the tabloids (and in two cases a presentation of the Product 2 videotape) as well as the distribution and (often) collection of response sheets. In addition, comments were solicited and recorded from participants at the meetings. The main project representative at these meetings was Jennifer Wilke. Occasional presentations were also made by Ernest Polley of DOE, and Rex Taylor and Lino Barril of OT.

Presentations were made at nine school board meetings and at the annual meetings of the Alaska Association of School Administrators and the Alaska Association of School Boards which met in Kodiak in October 1976. Additional presentations scheduled before six school boards were cancelled due to an airline strike and/or cancellations of the meetings. At the Kodiak meetings presentations were made to virtually all 52 Alaskan superintendents and approximately 100 board members.

The main purpose of the tabloid distribution, as well as the presentations, by project staff was informational. It was apparent throughout the meetings that the participants knew very little about telecommunications alternatives and their implications for solving educational problems. The initial responses were characterized by awe and skepticism. However, the responses following the presentations indicated a greater degree of understanding and enthusiasm. Since knowledge about telecommunications and enthusiasm for its applications were viewed as necessary to the implementation and ultimate success of the telecommunications project, the tabloid distribution and presentations were quite valuable. As strategies for data collection they were less successful. A total of 75 completed response sheets were returned for analysis. Approximately half resulted from the presentations and half from the mailing.

The results of the Telecommunications Alternatives Survey are summarized in a subsequent section of this report.

B. PROPOSAL DESIGN PARTICIPANTS

1. TASK FORCE EVOLUTION TO USER'S GROUP

Effective August 1, 1976, the Task Force described in Section IV of this report was expanded to a 21 member User's Group. The group was composed of executive leadership from organizations and associations including those representing teachers, superintendents and school boards. The function of the group was reactionary. It was to respond to the proposal in whole with particular attention paid to the consumer control mechanisms and management processes in the proposed project. The members of this group are listed in Appendix 11. DOE members included representatives from the areas of Correspondence Study; the Post Secondary Commission; Management, Law and Finance; Alaska State Museum; Adult and Manpower Programs; Right to Read; Adult Basic Education; General Education Development; Elementary Education; Fire Service Training; Special Education; Education Program Support; and Public Information. Also included were members from Alaska School Boards; Anchorage Borough School District; Juneau Borough Schools; Capital Elementary School (Juneau); and the Alaska State Library. Members added in September were the four superintendents from the Bristol Bay Region, the area selected for an intense pilot project in the proposed project.

The User's Group met on two occasions. The August 30 meeting was primarily informational. At the September 23-24 meeting the User's Group reviewed the draft of the preliminary proposal and offered suggestions and comments relative to its revision (the October 1 draft). These comments and suggestions were recorded in the minutes of the September 23-24 meeting (Appendix 12).

2. ESTABLISHMENT OF DESIGN TEAM

The Design Team was a working group charged with the responsibility of determining the design parameters and overall direction, and providing pertinent information to the design subcontractor. Members of the Design Team occasionally assisted with the drafting of subsections of the preliminary proposal. The initial Design Team consisted of the following members.

<u>Member</u>	<u>Agency</u>
Ernest Polley Project Manager	Planning and Research, Alaska Department of Education
Frank Anderson Director for Systems Design	Design Subcontractor; Northwest Regional Educational Laboratory
Robert Lehman	Office of Planning and Research, Alaska Department of Education
Kenneth Kokjer	Institution of Arctic Biology, University of Alaska
Rex Taylor	Alaska Governor's Office of Telecommunications

George Shaginaw

Alaska Governor's Office of Telecommunications

Jay Campbell

Data Processing, Alaska Department of Administration

Robert Hansford

RCA Alascom

Added to the Design Team in August was William Bramble of the University of Kentucky under contract to NWREL. Tom Olson of NWREL was added in September and Richard Wells of RCA Alascom replaced Robert Hansford in September. Thus the Design Team ultimately consisted of two members from DOE, two members from OT with experience on previous Alaska telecommunications projects, three members from, or under contract to, NWREL (two with experience on other NIE funded satellite projects), one member from the Department of Administration's Data Processing Unit, a faculty member from the University of Alaska (an engineer experienced in the use of computers in telecommunications), and a member of the RCA Alascom Marketing Division.

Formal meetings of the Design Team were held on July 26-27, August 11, August 30, September 8-9, and (concurrent with the User's Group) on September 23-24.

The purposes of these meetings were as follows:

July 26-27	Organization and planning.
August 11	Consideration of design parameters.
August 30	Establishment of design parameters. Assignments for completion of September 15 draft.
September 8-9	Review of modules for September 15 draft of preliminary proposal.
September 23-24	Review of September 15 draft of preliminary proposal.

In addition, the majority of the members of the Design Team provided assistance with the preparation of the preliminary Proposal (October 1 version) and Final Proposal submitted to NIE in January 1977.

3. ROLE OF THE DESIGN SUBCONTRACTOR: NORTHWEST REGIONAL EDUCATIONAL LABORATORY

A subcontract was awarded, in July 1976, to the Northwest Regional Educational Laboratory under the FY 1977 \$85,000 grant to DOE from the Alaska Legislature. The contract stated that the purpose was "to provide technical assistance to the Department in planning and designing

a four-year statewide educational telecommunications program. Focus of the planning and design shall be upon administrative and instructional uses of communications technology to address Alaska's unique needs in overcoming communications problems of distance, time, and space." The contract called for representatives of NWREL to be members of the Design Team and attend User's Group meetings, to prepare a draft of the preliminary proposal on September 15, to prepare the final draft of the preliminary proposal on October 1, to participate in the November 16-17 meeting with NIE for proposal review, and to prepare the final draft of the telecommunications proposal for submission to NIE.

C. TECHNICAL ALTERNATIVES TO MEET SPECIFICALLY DEFINED NEEDS

The Design Team specified five educational needs to be addressed in the proposed telecommunications project. The list of five needs was agreed upon at the August 30 meeting. The justification for these needs is contained in the final proposal submitted to NIE in January 1977. This justification, which includes the results of the DOE Planning and Evaluation Survey and the Telecommunications Alternatives Study is included in the following.

1. INTRODUCTION

To state the extreme case, any listing or description of the educational needs in Alaska would be incomplete until the needs of each and every citizenry group were known. While this is neither feasible nor necessary, the desirability of having a maximally responsible decision process is recognized in the proposed telecommunications project. This is reflected in the planned management structure. In addition, the components and content of the development strategy were selected and designed to be responsible to several of the general educational needs which exist in Alaska. These needs and departmental priorities were documented in the "Results of the Department of Education Planning and Evaluation Survey" 1976. The results of the study supported the general conclusions that the Department should (p.1):

"provide leadership in establishing and maintaining statewide goals, needs, and priorities;

identify and disseminate educational information, media resources and promising practices;

examine and improve certification procedures;

provide in-service training, especially through regional sessions;

investigate alternate means of funding schools;

improve communications (with local schools, both formal and informal);

maintain support and emphasis on the basic skill areas, especially reading;

develop new programs and curriculum and disseminate information about them (especially programs in careers, thinking skills and special education for the gifted) . "

A discussion of the specific needs addressed in this proposal follows.

2. EDUCATIONAL NEEDS

a. Basic Communications

The Planning and Evaluation Survey evaluated the services offered by the Department and identified those areas where additional support was required.

Since 78% of the respondents were teachers, teachers' opinions are dominant in the results. These broad conclusions, however, are generally supported by the responses of the educators in the other categories surveyed. One of the recommendations of the report mentioned above was that the Department should:

"improve communications (with local schools both formal and informal) . "

The problems of administrative and instructional support among and between (1) DOE, (2) school district offices, (3) the developing Regional Resource Centers (RRC's), and local schools are exacerbated by the geography, sparseness of population, and time zone differences described in the preceding section of the proposal. As an example, the Commissioner frequently needs to gain immediate district level response to situations occurring during the legislative process. To illustrate the difficulty in doing this consider the following. On August 13, 1976 the Department's newsletter contained the item:

"Lower Yukon School District now has access to a phone--543-2811. It's a village phone so Superintendent LaVern Etter advises callers to phone early in the day if they want to get through. Etter added, 'And it takes me about three minutes to run down there too.'"

Obviously, telephone communications are not always this difficult. However, polling all superintendents on a given day by phone, one at a time, it only barely feasible and -- from a practical standpoint -- almost impossible. The slowness of mail delivery compounds this problem. In facilitating the day-to-day interactions between DOE and local schools, the time for mail service serves as a factor which is variable and ranges from two days to two months. The matter of communications on basic record-keeping, forms transmittal and information transmission can, and does,

become hopelessly bogged down in the turn-around times of delivery via mail.

Telephone communications involving calls to DOE originating at the rural school district level are often surprisingly difficult even where school phones exist. For example, in Naknek, where two school district offices are located, there is a shortage of long-distance lines and calls to DOE often take several days to complete. Such calls must often be made during the early morning hours before the workday commences.

In the rural areas, intra-district management communications suffer from its own unique (and perhaps more severe) set of problems. In one district without a highway system, local schools lie approximately 200 miles in either direction from the central office. In another, the district superintendent must charter an airplane at a cost of several hundred dollars to be able to talk with the chairman of his school board. Transmission of written documents (memos, curriculum guides, etc.) is at best -- a lengthy undertaking.

The management of direct instructional support is reduced to a few expensive aircraft charters to crisis locations. Consider, for example, the communications links in the Bristol Bay Borough and Lake and Peninsular school districts southwest of Anchorage. According to the latest information, five village schools have no telephone communications and 18 have only radio phones. Thus, the 78% of the schools having telephone service of any type depend upon a form of communications heavily affected by atmospheric conditions in a region where adverse conditions are prevalent. The radio phones do not provide a dependable system for administrative or instructional support.

Thus, there is a need to establish an administrative and instructional support communications network characterized by interactive capacity, minimal on-site support personnel, and cost effectiveness. (Need #1)

b. Resource Identification and Linkage

A recommendation of the 1976 Department of Education Planning and Evaluation Survey was that

"emphasis should be placed on a coordinated plan to disseminate information, promising practices, and talent bank (data)."

The initial answer to this need has been Project A-TIP (Alaskan Talent Information, and Promising Practices), an NIE funded project housed in DOE. Through the A-TIP project, educators will have access to state and local resources and to an information retrieval and dissemination service provided by the San Mateo Educational Resource Center (SMERC).

The SMERC linkage provides Project A-TIP with a variety of information and instructional resources. The information resources available

include ERIC, and therefore RIE and CIJE. These documents are accessed through the use of Lockheed's ERIC/DIALOG. In the area of instructional resources SMERC provides access to FIDO (Fugitive Information Data Organizer). This is a catalog which indexes fugitive materials developed by educational practitioners. The SMERC linkage will be of maximum value for its capacity to retrieve these instructional materials.

The primary product from activities of the A-TIP project will be a statewide system for continuous exchange of information and sharing of products between educational agencies within the state and several agencies from outside the state. The project was conceptualized and developed around six primary dissemination functions. These are:

- identification of user characteristics and information needs;
- promotion and development of user awareness;
- user access to the information and materials repository;
- identification and description of instructional resources;
- acquisition and processing of instructional resources;
- instructional resource and information distribution.

The general goal for this project is to design and test a statewide dissemination system which:

- is based upon user information needs;
- employs various forms of technology, including telecommunications, for distribution of materials and information;
- functionally integrates all instructional resources available for use within the state.

In May, 1976, A-TIP personnel completed a User Needs Survey. The purpose of this survey was to gain some indication of the types of information desired by administrators and teachers in the State of Alaska. A 64-item questionnaire was administered to a limited sample of educators from 21 school districts in the state. Items were designed to assess the importance of informational needs in eight categories. These were: Method/Activities; Content; Cost; Student Behavior; Teacher Behavior; Evaluation; Facilities; and Other. The individuals surveyed indicated high information needs in most categories.

Several A-TIP workshops have already been held in the state to explain the services provided by the project and the methods for requesting information. The requests for information resulting from the workshops have

been substantial. However, a problem encountered in the project has been the slowness and/or unavailability of a vital telecommunications link. Thus a second need to be addressed by the project is stated as follows:

There is a need to establish a method for rapidly accessing repositories of a wide variety of instructional materials and related information. (Need #2)

c. Student Diagnosis

Student assessment in Alaska has been piecemeal at best. Tests have been selected and administered through local option and data relative to student performance was not available. Recent policy decisions in the State have emphasized the need for more systematic data on student performance if truly effective instructional programs are to be developed.

With this perspective in mind the DOE Office of Planning and Research addressed the problem of development of a statewide system of student assessment. After completing pilot projects in which commercially prepared tests were tried out in a number of school districts, a conference on student assessment was convened in Anchorage in February 1974. Office of Planning and Research personnel met with teachers from 50 schools from eleven school districts who had previously volunteered to utilize a published test. From that experience, and a broad survey of available testing systems, a firm decision was reached at a March 1974 meeting, attended by teachers and administrators from the eleven school districts, to proceed with the development of a statewide criterion referenced student diagnostic system. The system was to be based on educational objectives identified by Alaskan teachers.

This lead to the formulation of the Statewide Instructional Support System (SISS) and the Alaska Objectives and Items Bank (AOIB). The AOIB includes objectives and items in Reading and Computational Skills for grades 1-8. Items from the bank were administered to a 20% sample of students statewide during the 1975-76 school year and the experience was judged a success. Statewide implementation is scheduled for Fall 1977. Services to schools will include the administration and scoring of tests for students not included in the annual sample and a teacher scored diagnostic test. In addition, teachers may wish to select from the objectives bank and manually construct a customized diagnostic test. However, the delivery of customized tests and the rapid, efficient gathering of student responses to items by DOE is nearly impossible under this manual system of student diagnostics. The implementation of the full power of the testing system depends on the rapid long-distance transmission of customized tests and student responses. Average turn-around time via mail on commercial test scoring services is approximately seven weeks. Thus a third need to be addressed by the project can be stated as follows:

There is a need to provide individual student

diagnostic services, especially in the areas of reading and computational skills, and to do so on an as-needed basis. (Need #3)

d. Rural Secondary Education

A recent NIE publication entitled "Economy, Efficiency, and Equality: The Myths of Rural School and District Consolidation" by Sher and Tompkins discusses the issue of rural school consolidation. The authors state (page 1) that:

"The most successfully implemented educational policy of the past fifty years has been the consolidation of rural schools and rural school districts. One room, multi-graded elementary schools have been eliminated in favor of larger, many-room, age-graded schools. Small rural high schools have been closed down and new, centrally-located schools built to which most students are bussed. Small school districts have merged with neighboring ones and larger schools have been built with the new district."

The authors note that school consolidation was based on notions that "bigger is better". That economy of scale provides that possibility for "a reform of unlimited potential for solving most of the problems long considered the hallmark of rural education". The only objections to consolidation historically came from parents who did not want their children to travel to distant communities or feared the effects of consolidation on the life and vitality of their individual communities. However, these individuals had to concede that consolidation would save money through a combination of scale economics and increased operating efficiency. Everyone assumed that the better qualified administrators and teachers attracted to consolidated schools would provide a higher quality education than their less credentialed rural counterparts.

The authors note (page 3-4) that:

"Given the enthusiasm with which professional educators encouraged consolidation, one would expect the empirical evidence supporting their assertions (about the advantages of consolidated schools) to be overwhelming. It is not. The supporting evidence is incomplete -- many critical questions and potential liabilities are simply ignored. It is methodologically unsound, with almost every study open to criticisms severe and significant enough to make their findings extremely suspect. The conclusions are, at best, inconclusive; and at worst, simply incorrect. In short, there is no strong empirical base to support the assump-

tions and assertions of school and district consolidation advocated. Thus, while consolidation has become the conventional wisdom in rural education, careful scrutiny of the available evidence makes the adoption of this particular policy appear to be more conventional than wise."

The authors go on to destroy what they call the myths of economy, efficiency, and equality of rural consolidated education and recommend the following (pages 40-42):

"Small schools deserve more attention...
Alternatives to consolidation and reorganization should be seriously considered...
Research done in order to demonstrate the value of a practice (such as consolidation) should be scrutinized very carefully."

Consolidation of rural schools in Alaska had, at one time, taken the form of boarding school at the secondary level. With the sparseness of population, distances involved, and difficulties of transportation, the bussing model has not been appropriate for the state. The negative social and personal consequences of the separation of secondary students from their families and communities through attendance at such boarding schools were tremendous. Based on the evidence and the desire of Alaskans for equality and local control in education, legislation was passed which decentralized the state-operated system of rural schools. Despite the absence of local government, the state created 21 new regional school districts. In addition, the legislation was sensitive to an issue raised by a major Alaskan court case (*Tobeluk v. Lind*) which focused on the need to provide education at or near the student's place of residence.

One of the provisions in the legislation requires that secondary education be provided, if a village desires, regardless of the number of students. In the Bristol Bay area (Region #4) the operational definition of this provision is to initially provide a ninth and/or tenth grade program in each village where there is at least one eligible secondary student. Though the implementation of rural secondary programs varies across the parts of the system, the problems of providing a comprehensive secondary program with limited staff and facilities and under isolated conditions are similar. Thus in rural secondary education:

There is a need to provide direct instructional support in those situations where limited staff required the teacher to serve in the role of facilitation of learning rather than teach per se.
(Need #4)

There is a corresponding need to provide teacher in-service training and teacher support in a manner that does not always require the physical relocation of staff. (Need #5)

3. TELECOMMUNICATIONS ALTERNATIVES SURVEY

a. Procedures

The response sheet included in Product 2 (described earlier) allowed educators to rank the importance of four categories of Alaskan educational needs that could be enhanced and improved by better communications systems:

Instructional Resources and Programming

Staff Development

Information Exchange

Management

In August 1976, five thousand copies of the newspaper were mailed directly to all schools for distribution to all public school teachers, both rural and urban. The form included for response was self-contained, and included return postage.

In addition to this report, an on-site visitation was made by project staff to 26 representative districts. The presentations and work sessions with school boards, teachers and community members were conducted to inform participants of the improved communications network underway statewide, and its specific relevance to improving communications to each school. Reactions were sought, using the second informational package to allow participants to determine and identify communications needs priorities in their district.

b. Results

With the intent of gathering field input as directly and effectively as possible, an itinerary was established to allow project presentations to a sample of rural and urban superintendents and school boards, to explore the specifics of communications needs and the applications of the proposal as drafted.

Time for this effort was limited (late September and most of October of 1976); travel funds were limited; the only airlines serving Juneau went on strike as travelling was to begin; and a number of board meetings were cancelled or postponed. Given those restrictions, sessions were still held with a good cross-section of Alaska's boards and, with the mailed responses, a viable sampling of opinions and interests was obtained.

The effort culminated in a substantive presentation by the project director and the field input coordinator, to the Alaska School Association in Kodiak in late October, a meeting attended by virtually all 52 public school superintendents in the state.

An additional portion of the field input effort involved the distribution by mail of the written report of Product 2 and response sheet to all public schools in the state. Distribution within each school was the responsibility of the principal or building supervisor.

A large return of response sheets was not anticipated. The intent of the mailing was primarily informational. However, it did allow feedback by those interested. A sample of the narrative responses returned are included and quoted within this summary, primarily as articulated validations of observations in the field. The prioritized responses are listed.

The informational content of the distributed material was high, requiring heavy concentration and appreciable time to complete the questionnaire. The subject matter is new to many, and appears complex to most. Given those parameters and inhibitors of user participation, 75 responses were received. The majority (32%) came from Anchorage, 10% from Fairbanks, 6% from Sitka, with the remainder distributed fairly equally from 11 of the 21 regional districts, and 13 of the 31 city and borough districts. The majority of respondents were teachers (80%), with 16% either full or part-time administrators. The grade levels represented by the respondents are as follows:

	<u>Percent</u>
Elementary K-6	30
Jr. High 7-8	14
High School 9-12	24
K-12	27
7-12	4
Partial High School (9-10)	1

The school sizes represented were:

Under 100	10
101-300	21
301-500	13
Over 500	26

The data from the response sheet used in the survey are summarized in Table I. The percentage of responses is given for each of the five categories (from high to low priority) for each item on the questionnaire. The item means are presented in the final column.

It is apparent from these data that almost all of the items on the questionnaire received a positive rating. The items receiving the higher ratings are typically those having to do with instructional resources, individually initiated (as opposed to required) staff development, informal information exchange, increasing input and information on state guidelines and forms, and the computerization of reporting methods. Items rated somewhat

TABLE I
COMMUNICATIONS APPLICATIONS (MAIL RESPONSE)
MEAN RESPONSE

	HIGH PRIORITY 5	4	3	2	LOW PRIORITY 1	MEAN
INSTRUCTIONAL RESOURCES						
FOR GETTING RESOURCE MATERIAL	37	19	17	17	10	(3.58)
TO EXPAND COURSES AND CURRICULUM	39	28	14	7	12	(3.73)
FOR GETTING RESEARCH FINDINGS	25	19	32	13	11	(3.31)
STAFF DEVELOPMENT						
FOR EARNING RECERTIFICATION CREDITS	24	16	27	10	23	(3.09)
FOR KEEPING RECERTIFICATION RECORDS	17	6	27	15	35	(2.54)
FOR PROVIDING TRAINING OPPORTUNITIES	43%	28%	13%	4%	12%	(3.86)
INFORMATION EXCHANGE						
TO INFORMALLY EXCHANGE INFORMATION AND IDEAS	21	32	37	0	10	(3.52)
TO IMPROVE SCHOOL BOARD COMMUNICATION	17	22	33	17	11	(3.16)
TO DISTRIBUTE DEPARTMENT INFORMATION IN MEDIA	12.5	12.5	50	25	0	(3.13)
TO INCREASE PUBLIC INPUT TO DEPARTMENT	16	42	26	11	5	(3.52)
MANAGEMENT						
TO ARRANGE MEETINGS ON SHORT NOTICE	15	16	25	16	26	(2.78)
TO INCREASE INPUT AND INFORMATION ON STATE GUIDELINES AND FORMS	18	29	27	10	16	(3.22)
TO OFFER COMPUTERIZED REPORTING METHODS	27	16	37	8	12	(3.35)

lower were those regarding the keeping of recertification records, the distribution of information from school board and the State Department of Education. The information clearly reflects the preference of the teacher-dominated sample. The priority ratings for administrative applications of communications would likely be higher in a group representative of educational administrators.

In addition to the responses to the questionnaire, comments and suggestions were solicited from participants at the meetings held throughout the state. These comments were carefully recorded. A representative sample of comments follows:

Instructional Resources and Programs

As a board member in Valdez stated, anticipating the project's applicability to expanding Valdez's contact with the rest of the state, and consequent expansion of learning experiences for students: "The real question is not how much will it cost us, but how much will it save us?"

From a teacher in Sitka: "My biggest problem is lack of instructional resource materials or their availability. Perhaps some are available and I just haven't heard. We need current listings of materials and their location available to each school and speedier delivery."

"A big problem is the lack of resource materials and using obsolete and outdated materials. With better communications we could share resource materials when needed, rather than waiting for the physical exchange of limited materials between many areas."
(Southeast Islands Rural Teacher)

"My biggest frustration? Lack of access to information and lack of communications." (Yukon Koyukuk Rural Teacher)

Staff Development

The Alaska Regional Secondary School (ARSS) Forum stated the case for secondary training needs: "Practitioners and consumers agreed that the crucial element in the delivery of education in rural areas is the teacher. Traditional teacher education programs have been turning out specialists unprepared for teaching bicultural students in a small high school situation requiring flexible generalists... Courses which will enable experienced teachers to become more effective bush educators must be developed and offered...."

"We need specific program in-service to answer needs-- i.e., food service, maintenance training, aides, special education, remedial, etc." (North Slope Borough Administrator)

"We need some means of offering courses we may not have a staff member qualified to teach." (Southeast Islands Teacher)

Information Exchange

"Sometimes I feel so isolated. One day I know I'm the worst teacher, and maybe the next week I feel I'm the best in the world. But there's no faculty lounge for me to go to, no way to compare my ideas or methods with anyone. You really need that."

"Management needs this too. Board members and administrators might have a look at innovative and exemplary programs from across the nation. And we could share a few ideas on tape with others, too. We have a rare mix of excellent staff/programs here." (Ketchikan Teacher)

"...Possibly a dialogue by telecommunications would be more fruitful than written and occasional personal communications, as immediate feedback occurs, AND YOU CAN'T LOSE A CONVERSATION IN A PILE OF PAPERS!" (Ketchikan Teacher)

Management

Administrators reacted positively to the mail-box system described in the section on project implementation, though some remain skeptical of the quality of their local line and the foul-ups it may cause. Many expressed the desire that training and operator language be as simple and direct as possible, and concurred in the need for trouble-shooting assistance, particularly when the service is first initiated.

"In the twenty years that I've been teaching, the profession has been inundated with marvelous machines and teaching systems all designed to aid student learning and make teaching "easier" (ha!) and provide better results. Well--I have found that the children are in about the same boat scholastically regardless of all the innovations; and teaching has become increasingly difficult. Discipline has become a major time-consuming chore; and when I see some of the irresponsible, shiftless, drifting high school graduates we are producing--I wonder. I seriously doubt if a telecommunications system would really eliminate paperwork." (Southwest Rural Teacher)

"It would be a shame if the bureaucracy of controlling the system negated the effectiveness of which the system is intended! Whichever expedited the applicability of the system." (Yukon Koyukuk Rural Teacher)

c. Comparison of Findings of the Technical Alternatives Study and the Needs Identified for the Proposed Telecommunications Project

Need #1. To establish an administrative and instructional communications network characterized by the interactive capacity, minimal on-site support personnel, and cost effectiveness.

Returns of the response sheet were primarily from teachers who, as, expected, had less than a keen interest in the applications of telecommunications to administrative problems. They did give a high rating to the management item most directly affecting them (#5), "to increase input and information on state and federal guideline and forms" and a moderately high rating to item #5 "to offer computerized reporting methods." The recorded comments of administrators indicated strong support for the proposed computerized mailbox communications system in addressing a variety of management problems they face.

Need #2. To establish a method for rapidly accessing repositories of a wide variety of instructional materials and related information.

Strong support was evidenced for this need based on the responses to items #2, 3, and 4. These items deal with the need for instructional resources to expand courses and curricula, for getting resource materials for instruction, and for information exchange.

Need #3. To provide individual student diagnostic services, especially in the areas of reading and computational skills, and to do so on an as-needed basis.

There was no item which directly represented this need.

Need #4. To provide direct instructional support in those situations where limited staff required the teacher to serve in the role of facilitation, rather than teach per se.

This need was not assessed directly on the questionnaire, but the high ratings for the instructional resources items (#2 and 3) lend support to the existence of this need.

Need #5. To provide teacher in-service training and teacher support in a manner that does not always require the physical relocation of the staff.

The high rating for item #1, "staff development, for local training opportunities" is direct verification of need #5.

4. SELECTION OF TELECOMMUNICATIONS ALTERNATIVES TO MATCH THE SELECTED EDUCATIONAL NEEDS

The Design Team spent a substantial portion of time at the July 26-27, August 11, August 30, and September 8-9 meetings considering this issue. The deliberation was guided by two factors. These were:

The telecommunications medium selected to meet each need must provide a technically appropriate solution to the need and be acceptable to the ultimate users of the system.

Where alternative media can be brought to bear on the solution of a particular need the most effective alternative affordable should be chosen.

The entire array of transmission alternatives from one-way audio to two-way video were considered. Both voice and data audio transmission, facsimile transfer, and computer utilization were considered. At each stage of the deliberations information about the feasibility and costs of providing the proposed telecommunications services was provided by the OT and RCA Alascom representatives.

The telecommunications formats delineated in Product 2 were considered. There were:

1. Audio simplex (1)
2. Audio duplex (2)
3. Radio (3)
4. Computer information and data (4)
5. Television (6)
6. Television and two-way audio (7)
7. Television teleconferencing (12)

The numbers in parentheses indicated the comparative earth station and transponder costs. When these seven telecommunications formats are crossed with the five selected educational needs the two dimensional matrix depicted in figure 5 results. The formats chosen to address each need are indicated in the figure. A discussion of the chosen formats and the reasons for their selection follows.

A cursory glance at figure 1 reveals that none of the last three telecommunications formats, all involving television transmission, was selected. The reason for this was simply the high cost of utilizing these

TELECOMMUNICATIONS FORMAT

EDUCATIONAL NEED	AUDIO SIMPLEX	AUDIO DUPLEX	RADIO	COMPUTER INFORMA- TION AND DATA	TELE- VISION	TELEVI- SION AND TWO-WAY AUDIO	TELEVI- SION AND TELECON- FERENCING
1. ADMINISTRATIVE COMMUNICATIONS		X		X			
2. RESOURCE IDENTIFICATION AND TRANSMISSION		X		X			
3. STUDENT DIAGNOSIS		X		X			
4. CLASSROOM INSTRUCTIONAL SUPPORT		X	X	X			
5. STAFF TRAINING AND SUPPORT		X	X	X			

FIGURE 1. MATRIX OF EDUCATIONAL NEEDS AND ALTERNATIVE COMMUNICATIONS FORMATS CONSIDERED. CHOSEN FORMATS ARE INDICATED BY AN X.

alternatives. With the technology currently available in Alaska an entire satellite transponder and upgraded earth station equipment are needed for full motion video transmission. Consequently, the costs of transmission for motion video are extremely high. Based on RCA cost estimates, video transmission of the required magnitude would have consumed the entire yearly activities. Since the full transmission costs are to be born by the project, motion video was discarded. Single frame transmission of video over audio lines was discarded, at least for the present, due to the high cost of terminal equipment.

Thus the decision was made to use high quality audio transmissions, both voice and data. This was judged to be realistic both from an implementation (using the earth stations being installed) and cost point of view. For a modest additional investment the data transmission system can be upgraded by typing into a computer system. This option was chosen to allow for a more versatile administrative network and to facilitate the other aspects of the project, especially student diagnosis and instruction. A final feature incorporated into the system was facsimile transmission. This was desirable for the most effective solutions to needs #2-5. Various forms of facsimile transmission, particularly high speed forms, were considered.

The telecommunications systems which evolved were designed for timely administrative communications using data transmissions to and from a computerized message storage and retrieval system, timely resource identification and transmission using two-way data and, in some cases, facsimile transmission, a student diagnosis system involving two-way audio (radio-type) system, two-way audio voice and data system and facsimile transmission. The instructional system will allow for instruction within selected village classrooms involving the following:

- Audio Lectures
- Audio Discussions
- Computer Management of Instruction
- Computer Assisted Instruction
- Computerized Student Diagnosis
- Materials Distribution

The specific systems chosen for the proposed project are discussed in more detail in the following section.

D. FINAL PROPOSAL: EDUCATIONAL TELECOMMUNICATIONS FOR THE ALASKA PROJECT

1. ABSTRACT

The four and one-half year telecommunications program, proposed by the Alaska Department of Education, has four purposes:

to provide basic communications capability to the state's 52 school district headquarters;

to examine and report the results of making research and instructional information collections which exist outside Alaska available to the state's educational practitioners;

to implement and evaluate the use of a semi-automated system of student diagnosis and academic recordkeeping; and

to design and use practical rural secondary school curriculum and instruction, using modern telecommunications to mediate instruction in the one, two and three teacher schools of rural Alaska.

The modern communications devices and instructional media to be used are:

A computer managed mail drop system using a combination terrestrial and satellite link from the University of Alaska's Computer Center via Alaska's fifty-two school administrative offices, six Regional Resource Centers, and two DOE offices and employing both CRT and facsimile transmissions to receiving schools;

acoustic and digital interface with San Mateo County, California's Education Resource Center equipment and subsequent delivery of this information via a combination land line and satellite link via a switching center in Anchorage;

a computer managed system to modernize the state's student diagnostic and record-keeping system using a satellite interconnection, and

a combination of responsive CIA, CMI and local looped pre-designed programming plus computer and audio tele-conferencing to aid rural secondary school instruction and provide selected teacher in-service opportunity to the students and staffs of the remote, village schools in the state.

All long-line traffic will be handled on a commercial basis by Alaska's long-line carrier, RCA Alascom. Operational demand requirements are for fail-safe 9600 baud lines and protected voltage line-drop in the rural areas.

Participation of the fifty-two school districts and regional and state educational agencies includes cost sharing of toll fees of locally initiated message delivery, with a phase out of federal support by the conclusion of the project's four and one-half year period.

Design of the educational system has been directed by the Alaska Department of Education's Division of Planning and Research with the technical support of the Educational Services Division, Northwest Regional Educational Laboratory. Engineering design assistance will be continued by the Office of Telecommunications.

Program management and account control, programming/instructional design, field services and utilization/training and formation evaluation will be accomplished by a unique contract arrangement over which the Alaska State Board of Education, through the State Department of Education, exercises control. The four and one-half year project employs a phased design, field test, evaluation, implementation protocol for staging the four major thrusts of its programs and employs recognized and appropriate methods of client participation in the design of program strategies, their implementation and evaluation and, further in their adaptation and adoption in Alaska's continuing statewide telecommunications effort.

2. PROJECT MISSION, STRATEGY, AND OBJECTIVES

a. Project Mission

The project mission is:

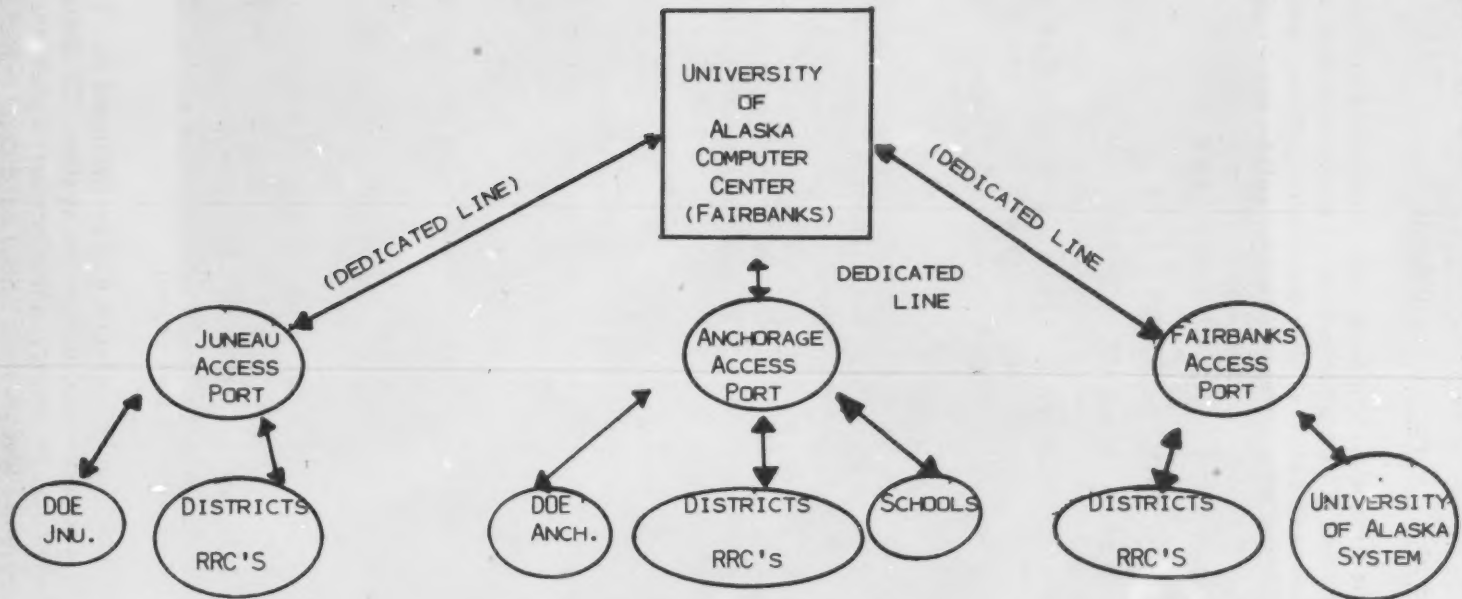
"To design, test, demonstrate, and diffuse administrative and instructional utilization of a variety of configurations of modern communications technology in Alaska."

b. Project Strategy

The basic approach employed in the project will be to implement the systems in the following manner: construct the system or a major portion of it, pilot the system using small-scale pilot runs to refine operational requirements and procedures, conduct a full-scale pilot study of the system, determine final operational requirements, and then determine the potential for full-scale expanded, continued operation of the system by the state and districts after the termination of federal funding. Thus there will be a continuing major emphasis on formative and summative evaluation in the project. The evaluation will attempt to determine not only how successful the project components are from a community, instructional, and administrative point of view, but also the cost-utility of the components and the long-range implications for continued use in the state.

Another critical ingredient relates to the production of the instructional components. Through systematically obtaining local input and, in fact, working in full partnership with the Bristol Bay Region educators, products will be developed to be maximally responsive to local needs and conditions. However, it will be recognized that a major goal of the project is to determine the prospects for statewide implementation. In this regard it is necessary that the products have a high degree

SCHEMATIC REPRESENTATION OF THE
LEVEL I ADMINISTRATIVE COMMUNICATIONS NETWORK



of usefulness for the entire state and are not tailored to a single region to such a degree that they have virtually no potential for exportability.

Level I - Core Communications

The first level will be a core communications system linking the State Department of Education offices in Anchorage and Juneau with six Regional Resource Centers, fifty-two district offices, and the University of Alaska Computer Center. These linkages will be provided via RCA satellite communications links to a computerized "mail-drop" system for sending, storing, and receiving written messages between and among the above agencies.

This Level I work will be designed to (1) facilitate rapid communications regarding administrative matters, (2) facilitate rapid access to educational materials and resources with the State as well as to the San Mateo Educational Resource Center (SMERC) in San Mateo, California, and (3) facilitate telecommunications project dissemination and user feedback.

The agencies ultimately having access to the system will be the Department of Education offices in Juneau and Anchorage, the 52 district superintendent's offices, six RRC offices, and 28 schools from four school districts in Region #4 (Dillingham, Bristol Bay Area). The individuals having access to the system would include, but not be limited to, the staff of the Department of Education, the 52 superintendents and their staffs, the Regional Resource Center, and the staffs of the selected Bristol Bay pilot schools.

The Level I System will link districts and regional resource centers to three access ports (Juneau, Anchorage, Fairbanks). These access ports are linked by dedicated line to the University of Alaska Computer Center in Fairbanks.

A graphic display of this network appears on the preceding page.

Level II - Intensive Pilot for Expanded Utilization

The second level of technology utilization will be housed within an intensive pilot region (the Bristol Bay Region) in Southwest Alaska. This second level will extend the above core communications networks to all 32 school sites within this region. In addition, a fully dedicated audio network will link the 32 sites in this region.

The Level II network will be designed to: (1) design and test utilization of a computerized diagnostic system, (2) design and test a 9th and 10th grade rural secondary education curriculum and delivery system, (3) design and test variable speed hard copy transfer, and (4) provide a capacity building site for expanded utilization of the student diagnosis and rural secondary curriculum and delivery system.

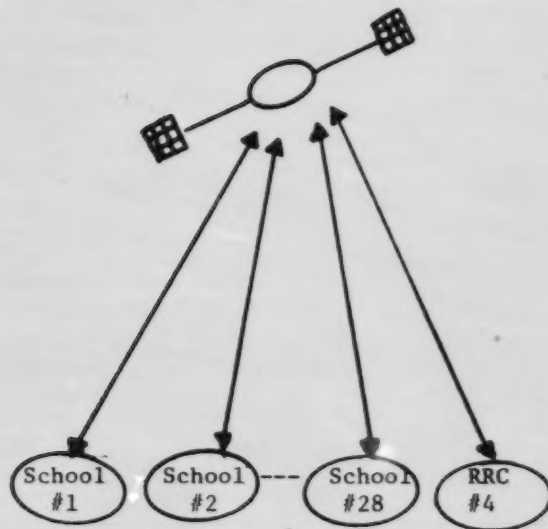
The area chosen for intensive implementation of the telecommunications project is the Bristol Bay Region. Regional Resource Center #4, located in Dillingham, serves the region. The area includes four school districts. These are: (1) Bristol Bay Borough School District (Naknek), (2) Dillingham City School District (Dillingham), (3) Southwest Regional School District (Headquarters at Dillingham), and (4) Lake and Peninsula School District (Headquarters at Naknek). The sites in the intensive pilot region include the following:

<u>Code</u>	<u>Site</u>
p	1. Regional Resource Center (Dillingham)
p	2. Bristol Bay Borough School District (Naknek)
p	3. Dillingham City School District
p	4. Southwest Region School District (Dillingham)
p	5. Lake and Peninsula School District (Naknek)
p	6. Bristol Bay Consolidated High School and Naknek Elementary School (same building)
p	7. South Naknek Elementary School
p	8. Dillingham Elementary School
p	9. Dillingham High School
v	10. Aleknagik School
v	11. Aleknagik-North Shore School
e	12. Clark's Point School
e	13. Ekwok School
e	14. Koliganek School
v	15. Levelok School
v	16. Manokotak School
e	17. New Stuyahok School
v	18. Ohgsenakale School (Portage Creek)
e	19. Togiak School
e	20. Twin Hills School
e	21. Chignik Bay School
e	22. Chignik Lagoon School
e	23. Chignik Lake School
v	24. Egegik School
e	25. Igiugig School
e	26. Ivanof Bay School
e	27. Newhalen School (Iliamna)
e	28. Nondalton School
e	29. Perryville School
e	30. Pilot Point School
e	31. Port Heiden School
v	32. Port Alsworth School

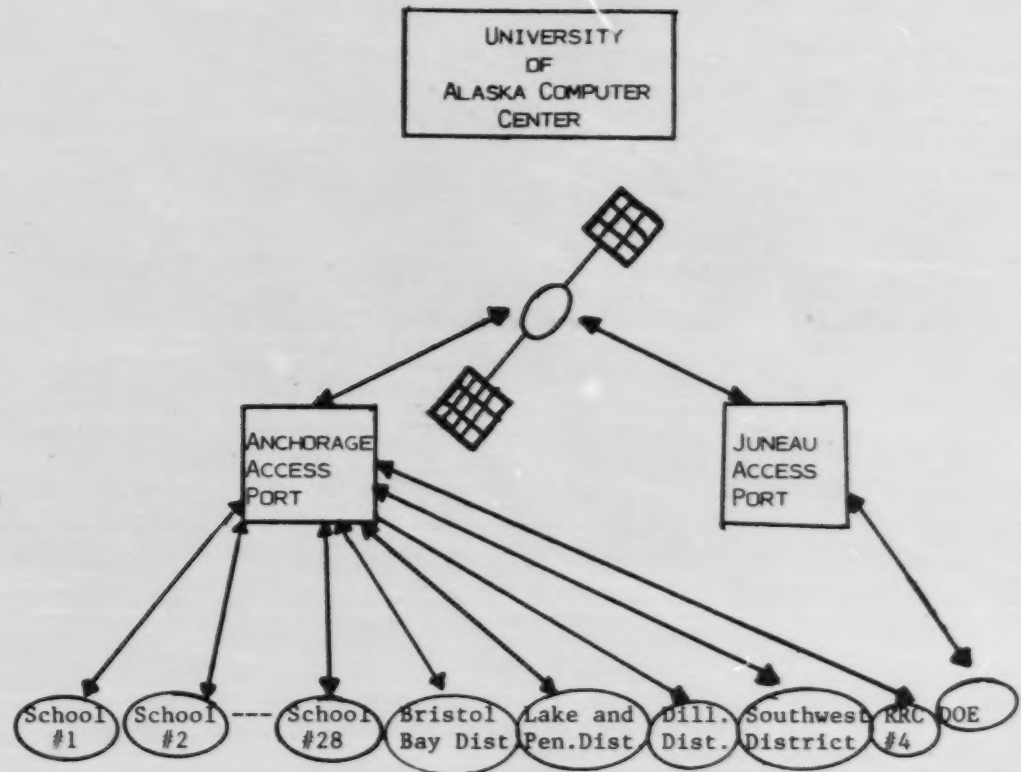
The major communications link is provided by the RCA satellite, the individual connections to the sites are designated (p) for local phone link, (v) for VHF link, and (e) for link to an earth station.

SCHEMATIC ILLUSTRATING COMMUNICATIONS NETWORK
FOR THE BRISTOL BAY REGION (INTENSIVE AREA)

DEDICATED LINE



'MAIL-DROP' AND COMPUTER ACCESS



E. T. A. PROJECT STRATEGY

LEVEL I

CORE COMMUNICATIONS NETWORK

- 2 DOE OFFICES
- 52 DISTRICT OFFICES
- 6 REGIONAL RESOURCE CENTERS
- UNIVERSITY OF ALASKA
COMPUTER CENTER

USES:

- ADMINISTRATIVE COMMUNICATIONS
- RESOURCE IDENTIFICATION AND
LINKAGE
- PROJECT DISSEMINATION/USER
FEEDBACK

LEVEL II

INTENSIVE NETWORK FOR INSTRUCTIONAL DISGNOSIS, DESIGN AND PROGRAMMING

- 32 SCHOOL SITES IN BRISTOL BAY
REGION

USES:

- TEST UTILIZATION OF COMPU-
TERIZED STUDENT DIAGNOSIS
SYSTEM
- DESIGN AND TEST 9TH AND 10TH GRADE
CURRICULUM AND DELIVERY
SYSTEM
- TEST VARIABLE-SPEED COPY
TRANSFER
- CAPACITY BUILDING FOR DIFFUSION

The communications links involve two networks. These two networks are (1) a dedicated line network and (2) the Level I "mail-drop" and computer access network. These two networks are shown in the chart on the following page. The dedicated line network will consist of a dedicated voice data line using primarily the Bristol Bay Area earth stations and the RCA communications satellite. Twenty-four hour per day scheduled access to the line will be provided for the 28 participating schools and Regional Resource Center #4 located in Dillingham. A variety of one-way and interactive instructional programming will be made possible by the system.

The second communication network included in the diagram, the "mail-drop" and computer access network, links the 28 Bristol Bay Area schools with the Regional Resource Center in Dillingham, the four district offices located in the Bristol Bay Region, and DOE/Juneau. Not shown on the diagram is the fact that this network also provides access to the other five RRC's, the 48 other district offices and DOE's Anchorage office.

3. PROCEDURES FOR PROJECT IMPLEMENTATION

a. Overview

This section provides detailed descriptions of the procedures to accomplish project objectives. The overall plan calls for the establishment of the Level I core administrative network in 30 sites within six months of project initiation. Within eighteen months, this system will be expanded to sixty sites. Within three and one-half years the system will be extended to the pilot schools in the Bristol Bay Region.

The Level II dedicated network will be operational in the Bristol Bay pilot region within three and one-half years of project initiation. Initial design and tests of the 9th grade programming will begin during the 1978-79 school year as will the small-scale pilot of the student diagnosis system. Tenth grade programming and additional testing of the student diagnosis system is scheduled to be added during the 1979-80 school year.

The work components related to the Level I and Level II networks are as follows:

Level I

- Administrative Communications Network
- Resource Identification and Linkage

Level II

- Student Diagnosis
- Rural Secondary Education

b. Level I Work Components

The Level I core communications "mail-drop" network will be utilized for improving administrative communications and for identifying and accessing educational resources.

The basic flow of information is controlled by the "mail-drop" system on the University of Alaska computer. Messages, typically in letter or memorandum form, can be entered by any user with an active ID number, addressed to any active recipient's file. Each user periodically checks his file to receive messages, and can enter messages at the same time. Access to the computer system is gained through access ports in Juneau, Anchorage, and Fairbanks. The nearest access port can be reached by telephone links from on-site terminals. A centralized system of billing and disbursements will be established.

The satellite communications link will utilize both large (10 and 30 meter) and small (4.5 meter) earth stations operating in the 4 GHz - 6GHz band. Service will be provided through existing spacecraft and a full range of technical services will be available. Narrow band circuits capable of handling 9600 baud, wide band radio, and video services are technically possible for the small earth stations. Communications links will be provided through existing communications carriers.

This core communications system will provide a much improved, vitally needed system for administrative communications such as the dissemination of decisions and information from DOE to the district headquarters; for the rapid polling of superintendents on decisions to be made at DOE; for communication among superintendents; and for back-up communications necessary for the implementation of other programs planned for the satellite project.

The second major use of the system will be to enhance the school districts' ability to identify and locate educational resources. Currently, the Alaska Department of Education's dissemination capacity building effort, supported by a grant from the National Institute of Education's Dissemination and Resource Group, is utilizing a system for accessing such resources which involves toll calls from district offices to the DOE offices in Juneau, then from Juneau to the San Mateo Educational Resources Center (SMERC), located in Redwood City, California. The information relay is then reversed either by toll call or by mail in the case of requests for printed documents.

The Level I core communications system will greatly accelerate this process for identifying and accessing educational resources. The Regional Resource Centers and the DOE will be linked by the computerized "mail-drop" system.

c. Level II - Intensive Pilot For Expanded Utilization

Background

As described earlier, twenty-eight school sites in the Bristol Bay Region will be served by the Level II communications system during the third and fourth project years. Emphasis of utilization in this intensive pilot region will be upon management and instructional support communications in geographically isolated and dispersed schools.

The absence of community services and other professional support in this rural context dictates that improved support service communications encompass a wide range of teacher needs--from teacher subsistence to consultation or students' educational and social needs.

The installation of the Level I core communications capability in the Bristol Bay Region will improve the flow and immediacy of communications among teachers, between teachers and district offices and between teachers and the Regional Resource Center.

The Bristol Bay intensive pilot effort, beyond installing a capability for improved intra-district communications and resource identification and linkage, will focus on two areas of critical need: (a) student diagnosis and (b) planning and delivering secondary education in the isolated rural villages.

Rural Secondary Education

Recent legislation which requires districts to establish secondary programs in all communities with at least one available secondary student, no later than September 1, 1977. The provision of a comprehensive secondary education program within the village school is made difficult by the fact that such schools may have only one or two teachers. It is unlikely that any one or two teachers, typically elementary level teachers, possess the range of educational knowledge and skills necessary to provide the variety of offerings required for a quality secondary level education. Further, needed materials and resources are likely to be unavailable.

A shift in the role of the village secondary teacher from conveyer of information to manager of student instruction backed up by a variety of resources delivered through a comprehensive tele-educational system is a possible long-range answer to several of the problems of rural secondary education in Alaska. The tele-education system envisioned for the project includes such components as audio instruction, inter-actional seminars and question and answer sessions, computer-assisted instruction, diagnostic testing and prescriptive instruction, supporting materials, and information systems. The instructional system will draw on and provide training to indigenous secondary instructors in order to leave in place a continuing system of rural secondary education for the

Bristol Bay area. The system will produce materials, instructional systems, and communications networks which the state can build upon to provide comprehensive rural secondary education programs statewide.

Student Diagnosis

In the Bristol Bay pilot region a system for constructing, administering, and scoring diagnostic tests will be implemented. The system will utilize the statewide Instructional Support System (SISS). This system includes a comprehensive bank of objectives and associated items in reading and computational skills (grades 1-8). Through SISS, criterion referenced tests can be generated which allow a teacher to determine whether a student has reached criterion level on a chosen set of objectives. The full capacity of the system can be realized in the intensive pilot region. A student, seated at a CRT terminal can be administered a tailor-made test of items corresponding to objectives selected by the teacher. Instant feedback can be provided to the teacher/student which shows which objectives the student has, and has not, mastered. The system will then allow for the delivery of prescriptive types of information, such as an indexing of objectives to on-site, regional and San Mateo based instructional materials.

Design and Implementation

The central principle which will govern the design and testing of rural secondary education curricula and delivery systems will be that of a "user-driver" development model. Representatives of the four districts in the Bristol Bay Region will be full partners in the development process. The mechanism for this partnership will be a subcontract with the Regional Resource Center. This subcontract will provide support to the four districts in providing staff, materials and released time to implement a series of decision processes related to the development effort.

d. Management and Coordination

Project Management: Structure and Functions

The project management structure recognizes that policy, utilization and implementation decisions rest with the following established operating user agencies in Alaska.

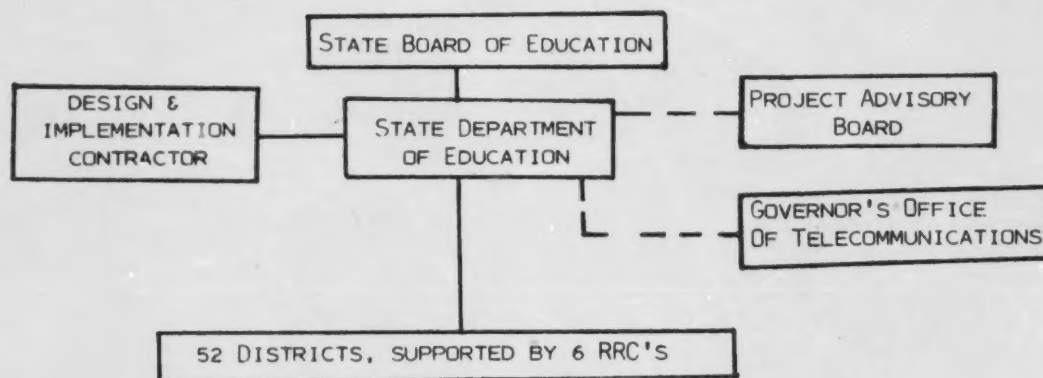
- The State Board of Education
- The State Department of Education
- The 52 School Districts

Based upon the policy, utilization and implementation decisions made by the above agencies technical support for design, production and installation will be the responsibility of two types of agencies:

- A Design and Implementation Contractor (under supervision of DOE) .
- Six Regional Resource Centers (governed by participation districts) .

Overall Structure

The overall structure can be displayed as follows:



State Board of Education

The responsibilities of the State Board of Education are to insure that project policies and procedures are consistent with statewide policy and priorities and to approve annual and long-range project scope of work plans.

State Department of Education

The State Department of Education is responsible for overall project planning, monitoring and systems evaluation. Based upon advice from a Project Advisory Board, the Governor's Office of Telecommunications and the 52 school districts, the Department is responsible for setting priorities for types of utilization and implementation modes and for designing annual and long-range scope of work plans for State Board approval, and to conduct an evaluation of systems effectiveness. In addition, the Department is responsible for maintaining statewide interagency coordination, communications and support mechanisms, and legislative liaison.

Fifty-Two Local School Districts

The 52 local school districts are responsible for providing user input to the Department of Education regarding types and modes of utilization, systems protocols for determining local levels of utilization, for determining levels of supplementary local support to maintain the systems, for identifying and communicating resource needs, and for determining the role of the Regional Resource Center in systems

utilization. In addition, the school districts are responsible for providing formative and summative evaluation data to the design and implementation contractor.

Regional Resource Centers

The project will install a capacity in each of the operational RRC's for their utilization of the administrative communications systems and the resource identification and linkage system. Within the intensive pilot region the RRC will play a key coordination role. The RRC in Region #4 will be the mechanism for training and support to each district in defining resource needs, in defining program priorities, materials and delivery system specifications, and utilization and adaption of resources identified through the resource identification and utilization system.

Design and Implementation Contractor (Northwest Regional Educational Laboratory)

The design and implementation contractor, under performance contract with the State Department of Education, is responsible for supervision of technology installation and maintenance, for user orientation and training, for technical design, production and quality control of instructional courseware and programming (based upon priorities defined by the districts in the intensive pilot region), and for conducting internal formative monitoring and pilot and field test evaluations within the intensive pilot region.

Project Milestones

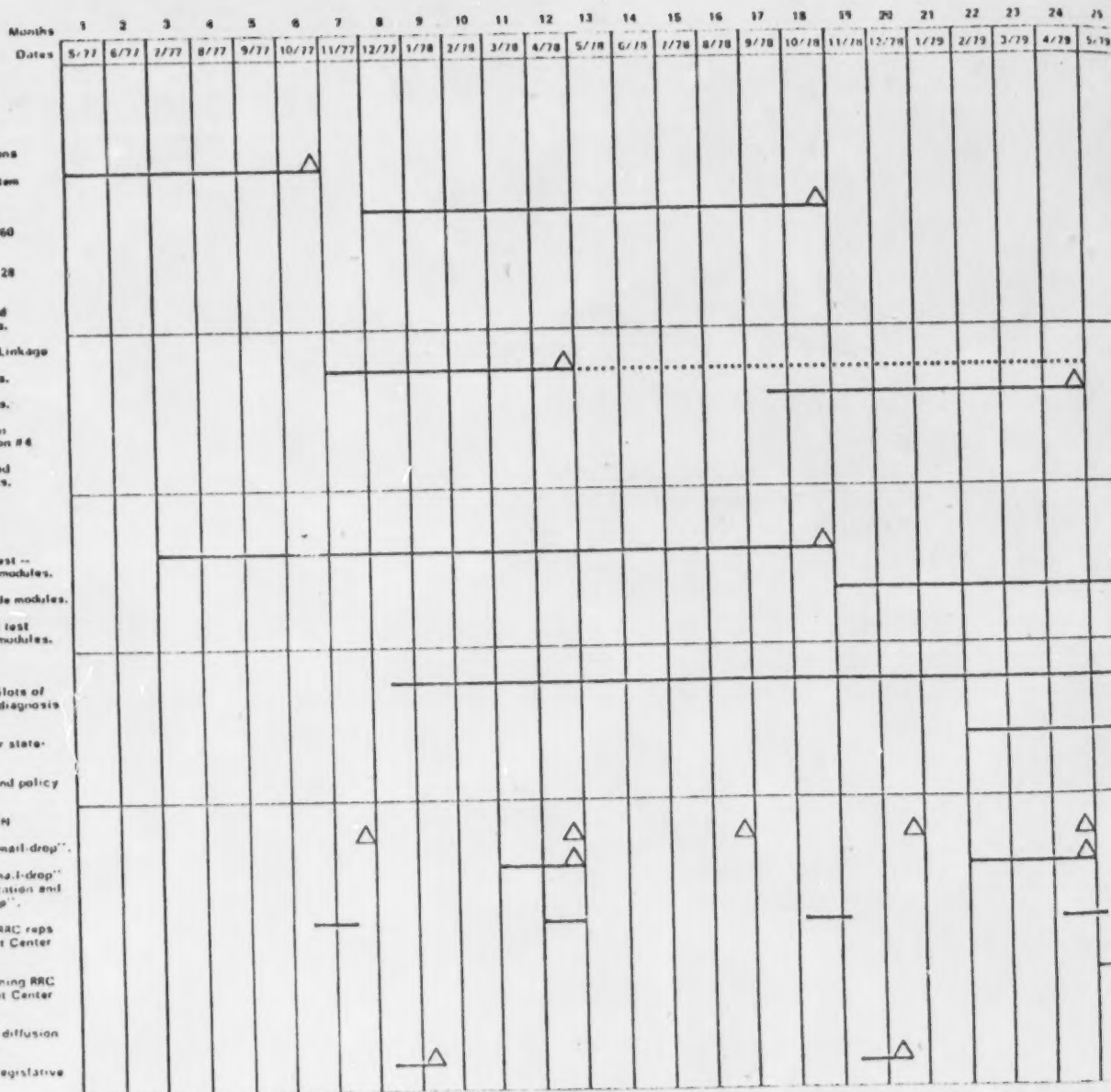
A chart showing the major milestones for the project is presented on the following page.

E. SUMMARY

Alaska's need for improved communications systems is undeniable, from increased capacity to adequately handled telephone traffic, to Alaska's desire to receive national television programming. The intervening spectrum of narrowband and broadband services, with the increasing capabilities realistically available for the first time by satellite, provides the means for practical problem-solving communications services to Alaskan educators statewide.

In pursuing detailed definition of the education needs most effectively met by improved communications, the Alaska Department of Education and the Governor's Office of Telecommunications have been working cooperatively during both demonstration experiments and future planning for the past four years.

PROJECT MILESTONES BY WGR
(Project Months assuming May 1



△ denotes completion of event, decision, document and report to N.T.E.

COMPONENT
1977 Start-Up)

[illegible]

The National Institute of Education/HEW has been a prime fundor to the State of Alaska for this activity since July 1973. This project and planning assistance, particularly upon conclusion of the ATS-6 DemoHET, has provided OT and DOE with the means to pursue needs identification and systems design models to move beyond experiments to optimum operational systems.

The key element incorporated into all NIE-funded activities has been user involvement and definition for potential and implemented services. This effort has culminated in DOE's long-range implementation proposal document. With installation and operation of the user-based system outlined in DOE's proposal, Alaskan education will become a direct beneficiary of an increasingly state-supported educational telecommunications delivery system.

DATE: September 17, 1975

If you feel you do not have enough information to answer any question, please leave it blank. We are as interested in what you do not understand as we are in what you now know.

What does the word telecommunications bring to mind?

- 4 - television & radio via satellite
- 1 - opening means of sharing information - exchange via satellite

How would you rate your overall knowledge of telecommunications in Alaska?

<u>1</u> None	<u>2</u> Familiar with terminology
<u>2</u> Minimal	<u> </u> Have worked in field

What implications do you feel telecommunications has for education in Alaska?

Ranging from basic educational services to bush, instructional tool (every home), special info needs and resources to teachers, teacher training, unique student programs.

Specifically, what types of education services do you see developing through telecommunications?

Basic skills, education for survival, providing resources for classroom and teacher, native language resource, general enrichment.

Do you feel that knowledge of telecommunications educational applications directly relevant to you and your job?

5 yes no don't know

How do you feel the Office of Telecommunications can be of direct assistance to you?

Program funding; technical assistance & consultation; identification of educational needs statewide.

How do you feel about the concept of establishing task forces within state departments?

Ranging from great to OK
"Distribution of labor" often leads to lack of knowledge by others.
Purpose must be established.

What is your understanding of the purpose of this task force?

- 3 - don't know
- 2 - to understand telecommunications, and keep people in own area informed

What would you like to see this task force accomplish?

3 - No response

1 - to be informed about OT 1- communication with remote areas of Alaska

Are you familiar with the ATS-6 satellite experiment? 4 yes 1 no

If no, would you like more information? 2 yes no don't know 2

Have you heard of the ATS-1 satellite experiment? 3 yes 2 no

If no, would you like more information? 3 yes no 2 don't know

What value do you feel television has as an instructional tool?

None Great

Please elaborate:

1 2 3 4
1 3

3- no response

1- according to use made

1- supplement to teachers/more & versatile talent/
attentive audience

What emphasis do you feel should be placed on computer-oriented instruction?

None Great

Please elaborate:

1 2 3 4
1 1

2- don't know

1- conflicting values

Following is a list of terms associated with educational uses of telecommunications. Please indicate your degree of familiarity with them.

	1 - no response	no knowledge	have heard term before	familiar*	very *
Data transmission			2	K	2
Computer-Assisted Instruction		1			3
Two-way video		2			2
Bandwidth		3	1		
Communication satellites			1		3
Footprint		1	1		2
Information retrieval			1		3
Computer-Manager Instruction		1	1		1
Simplex & duplex channels		4			
Transponder (satellite)		4			
Tariff		3			1

If you checked these indicators for any of the terms above please define them in the space provided below.

Definitions offered indicated fairly clear understanding of familiar terms.

DEPARTMENT OF EDUCATION Planning and Research
SUMMARY OF RESPONSES

TOTAL: 4

DATE: October 3, 1975

If you feel you do not have enough information to answer any question, please leave it blank. We are as interested in what you do not understand as we are in what you now know.

What does the word telecommunications bring to mind?

- coordination of types of communication into workable network or system
- communication through electro-technological medium
- wireless
- complex electronics/large staff of highly skilled technicians

How would you rate your overall knowledge of telecommunications in Alaska?

_____ None	_____ 2 _____	Familiar with terminology
_____ 2 _____	_____	Have worked in field
Minimal		

What implications do you feel telecommunications has for education in Alaska?

- only answer
- great
- profound
- help enable better education

Specifically, what types of education services do you see developing through telecommunications?

- | | |
|-----------------------------|-------------------------|
| --management | --instructional support |
| --training of staff | --educational TV |
| --information dissemination | --counseling |
| --computers | --evaluation |

Do you feel that knowledge of telecommunications educational applications directly relevant to you and your job?

_____ 3 _____ yes _____ no _____ don't know

How do you feel the Office of Telecommunications can be of direct assistance to you?

1 - yes 1 - no
help "sell" concept to Alaskans

How do you feel about the concept of establishing task forces within state departments?

1 - negative 1 - OK
works if committed to specific tasks

What is your understanding of the purpose of this task force?

4 - undefined

What would you like to see this task force accomplish?

N/A

Are you familiar with the ATS-6 satellite experiment? 2 yes 2 no

If no, would you like more information? 3 yes no don't know

Have you heard of the ATS-1 satellite experiment? 1 yes 3 no

If no, would you like more information? 3 yes no don't know

What value do you feel television has as an instructional tool?

None Great

1 2 3 4

Please elaborate:

1 1 1

only way to provide alternatives in rural areas.

What emphasis do you feel should be placed on computer-oriented instruction?

None Great

1 2 3 4

Please elaborate:

1 3

provides alternative/reasonable
cost and includes other
applications

Following is a list of terms associated with educational uses of telecommunications. Please indicate your degree of familiarity with them.

	no knowledge	have heard term before	familiar* with term	very * familiar	
Data transmission			1	3	
Computer-Assisted Instruction			1	3	
Two-way video	1		1	2	
Bandwidth		1	1	2	
Communication satellites			1	3	
Footprint		1	1	2	
Information retrieval			1	2	1
Computer-Manager Instruction			1	3	
Simplex & duplex channels	2	2			
Transponder (satellite)	2	1	1		
Tariff		3	1		

*If you checked these indicators for any of the terms above please define them in the space provided below.

DEPARTMENT OF EDUCATION
TELECOMMUNICATIONS TASK FORCE

December 1975

DIVISION OF EDUCATIONAL PROGRAM SUPPORT

Ronald Bedard - Federal Programs Specialist

Marcia Freer - Adult Basic Education Specialist

Jean Harlow - Federal Programs Specialist

Judi Hayden - Special Education Specialist

Eula Ruby - Right-To-Read Specialist

Verdell Jackson - Vocational and Career Education

STATE LIBRARY

Dan Monroe - Deputy Chief Curator - State Museum

Kay Rosier - Inter-Library Loan Librarian

PLANNING AND RESEARCH - OFFICE OF THE COMMISSIONER

Ernest E. Polley - Coordinator, Office of Planning and Research

Bob Lehman - Administrator, Development and Dissemination

Jim Melson - Systems Analyst

Paul Gulyas - Consultant

PUBLIC INFORMATION AND PUBLICATIONS, OFFICE OF THE COMMISSIONER

Mary Halloran - Coordinator

GOVERNOR'S OFFICE OF TELECOMMUNICATIONS

Rex Taylor - Agency Applications Manager

Charles Northrip - Associate Director for Telecommunications
Applications

		REQUIRED SATELLITE CAPACITY	PROGRAM SOURCE	EQUIPMENT		OPERATOR TRAINING		SUPPORT STAFF		SYSTEMS STABILITY	EQUIPMENT PLACEMENT	FLEXIBILITY OF USE
				TRANSMIT	RECEIVE	TRANSMIT	RECEIVE	TRANSMIT	RECEIVE			
ONE-WAY TRANSMISSION	AUDIO	1 or more audio channels	purchased programs or original productions (\$10,000 audio studio minimum)	transmit studio B (\$500 up)	\$500/site or less B	audio broadcast or production training	minimal	one equipment operator/ broadcaster or audio production staff	one or more	minimal maintenance probable/ mechanical repair	transmit center/ field admin. offices/ classrooms	direct or recorded
	TELETYPE	less than 1 audio channel	written message	\$1500 B	\$1500 B	operate teletype keyboard	minimal	teletype operator	one or more	standard maintenance probable	transmit center/ field admin.	direct
	VIDEO (still frame)	less than 1 video channel	resource material/ library A	transmit studio C	\$5000/site or less C	technical broadcast training	minimal	television production personnel	one or more	standard maintenance probable	transmit center/ field admin. offices/ classrooms	direct or recorded
	VIDEO + AUDIO	1 video channel + 1 audio channel	Purchased programs or original productions (\$75,000 TV studio minimum) A	transmit studio B	\$500/site or less B	television broadcast/ production training	minimal	television production personnel	one or more	standard maintenance probable	transmit center/ classrooms	direct or recorded
TWO-WAY TRANSMISSION	AUDIO	1 or more audio channels	purchased programs or original productions (\$10,000 audio studio minimum)	transmit studio B (\$500 up)	\$500/site or less B	audio broadcast or production training	minimal	equipment operators/ broadcasters or audio production staff	one or more	minimal maintenance probable/ mechanical repair	transmit center/ regional trans. centers/ field admin. offices/ classrooms	direct or recorded
	TELETYPE	less than 1 audio channel	written messages	\$1500 B	\$1500 B	operate teletype keyboard	operate teletype keyboard	teletype operator	one or more	standard maintenance probable	transmit center/ field admin. offices	direct
	FACSIMILE	1 telephone channel	written documents	\$1300 B	\$1300 B	operate facsimile copier	minimal	facsimile copier operator	one or more	minimal maintenance probable	transmit center/ field admin. offices/ classrooms	direct or recorded
	DATA TRANSFER (computer based)	more than 1 audio channel	purchased or original data program A	main computer or regional mini-computer C	computer terminals C	data processing	data processing	data processing personnel	one or more with training	frequent maintenance probable/ electro- mechanical repair	transmit center/ regional centers/ field admin. offices/ classrooms	direct or recorded
	VIDEO (1-way) + AUDIO	1 video channel + 1 audio channel	purchased programs or original productions (\$75,000 TV studio minimum) A	transmit studio B	\$2000/site minimum B	television broadcast/ production training	minimal	television production personnel	one or more	standard maintenance probable	transmit center/ classrooms	direct or recorded
	VIDEO + AUDIO	more than 1 audio + more than 1 video channel	live broadcasts A	transmit & receive studio B	transmit & receive studio	television broadcast/ production training	television broadcast/ production training	television production personnel	television production personnel	standard maintenance probable	transmit centers	direct

- A - requires earth station upgrade
 B - requires standard, readily available equipment
 C - requires specially modified equipment

TABLE 2. SUMMARY OF IMPLEMENTATION POSSIBILITIES

		IMPLEMENTATION POSSIBLE AS EARTH STATIONS BECOME OPERATIONAL	IMPLEMENTATION POSSIBLE ONLY AFTER FURTHER DEVELOPMENT OF EARTH STATIONS OR EQUIPMENT
ONE-WAY TRANSMISSION			
	AUDIO	X	
	TELETYPE	X	
	VIDEO (still frame)		X
	VIDEO + AUDIO		X
TWO-WAY TRANSMISSION			
	AUDIO	X	
	TELETYPE	X	
	FACSIMILE	X	
	DATA TRANSFER		X
	VIDEO (1-way) + AUDIO		X
	VIDEO + AUDIO		X

SIMPLIFIED GLOSSARY OF COMMON TELECOMMUNICATIONS TERMS

ANTENNA. A device for picking up or radiating radio waves.

AUDIO. Frequencies in the audible range or information destined for the human ear.

BANDWIDTH. The frequency range of a signal or channel.

BIT RATE. The speed at which data bits are transmitted or received; usually expressed in bits per second.

CHANNEL. A subportion of the radio frequency spectrum, through which a particular type of information, (audio, data, video) is passed.

CHANNEL CAPACITY. The amount of information a channel can pass per unit of time.

COMMUNICATIONS SATELLITES. Satellites whose primary purpose is communications.

DATA. Information coded in the form of symbols or numbers.

DUPLEX. A two-way communications system in which communications take place between two points using separate transmit and receive channels. In such a system information can be transmitted in two directions simultaneously.

EARTH STATION. A terminal on the ground that receives and/or transmits information via satellite.

FACSIMILE. A system of transmitting documents of graphic material so that the received copy is a reproduction of the original.

FREQUENCY. For a periodically changing electrical wave or voltage, the number of cycles per unit of time usually expressed in cycles-per-second (Hertz).

MULTIPLEXING. Combining more than one type of signal for transmitting over a single channel.

ORBIT PATH. The path used by an orbiting satellite.

SIMPLEX. A two-way communications system in which two or more stations use the same communications channel so that only one station can transmit at any one time.

SYNCHRONOUS EQUATORIAL ORBIT. An orbital path approximately 23,300 miles above the earth's equator. A satellite placed in this orbital path revolves around the earth once every 24 hours, always remaining over a fixed point on the earth.

TELETYPE. A system of communicating alpha-numeric information in which the information is entered at the originating terminal by means of typewriter-type keyboard, and printed out at the receiving terminal(s).

TRANSPONDER. Signal repeater in satellite.

VIDEO. The information contained in a television signal.

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ALASKAN EDUCATIONAL NEEDS AND POSSIBLE TELECOMMUNICATIONS APPLICATIONS

1. INSTRUCTIONAL PROGRAMMING

Basic 3-R skill support for elementary grades	Computer-Assisted Inst. using skill building games and drills
Rural secondary schools	
Vocational education	video 2-way audio
Additional curriculum such as environmental sciences, social studies, Alaskan history, cross-cultural studies.	video 2-way audio and slow scan video 2-way audio
ABE/GED Instruction	video 2-way audio
Fire Service training	

2. INSTRUCTIONAL RESOURCES

Regional resource center distribution of materials: films, articles, books, videotapes, audio or video courses with written supplements.	hi speed transmission of audio & video, for on-site recording; fax
Support materials for student assessment	fax
Access to SMERC, ERIC, etc.	computer-based
Talent Bank & promising programs exchange	" "

3. STAFF DEVELOPMENT

How to use telecommunications system	audio/video/fax
How to use student info on individual basis	" " "
Record keeping w/in staff development center and re-certification based on performance	computer based
Training of GED test Administrators	audio/video/fax

4. INFORMATION EXCHANGE

Increase professional communication through informal "rural faculty lounge"	2-way audio audio teleconferencing teletype
Provide school boards with immediate access to problem solving	24-hour audio "hotline"
Public information on programs, policies, changes	public radio via satellite

5. MANAGEMENT

Arrange meetings	2-way audio (party-line)
Teleconferencing calls	" "
(field staff, school boards, etc)	with fax
Financial accounting system	computer-based
Central ordering of materials	"
Increase assistance re federal programs	audio/fax
CETA client records	fax
ABE/GED monthly attendance forms	computer-based

RURAL EDUCATION TELECOMMUNICATIONS COMMITTEE MEMBERSHIP LIST

June Nelson	Kotzebue
Keefa Moxie	Aleknagik
Darryl Albert, Sr.	Galena
Althea Hughes	Gulkana
Alice Philemonof replaced by Angie Gromoff	St. George
Byron Skinna replaced by Mary Ellen Skinna	Klawok
Duke Delgado	Ouzinkie
Jonathan Summar	Tok
Nina Russell replaced by Billy Neakok	Arctic Village
Gloria Saari replaced by Jessie Tiedeman	Barrow
Robert O'Kitkun	Tatitlek
Charles Degnan	Cordova
	Bethel
	Unalakleet

Rural Community Telecommunications Consumer Committee

12 Members - One from each region.

Costs of travel and per diem to be paid by Office of Telecommunications.

- Meetings:
- 1) Late March '76-after election of REAA Boards.
 - 2) Early May '76-prior to production of DOE Product #2.
 - 3) August '76-to view and read Product #2.
 - 4) November/December '76-prior to development of Product #3 by DOE.

Responsibilities of Office of Telecommunications and DOE to the Committee.

1. Provide information on telecommunications alternatives for education in Alaska (Product #1).
2. Provide information on local options for use and distribution of services provided via telecommunications (Office of Telecommunications).
3. Provide existing research and assessment information on needs to be met in Alaska education (DOE).

Responsibilities of Committee to Office of Telecommunications and DOE.

1. Provide input to DOE and Office of Telecommunications on local reaction to the various telecommunications alternatives for education.
2. Contribute to the selection of specific educational applications to be addressed in Product #2.
3. Contribute to evaluation of Product #2 and formulation of specifications for Product #3.

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MINUTES OF SEPTEMBER 23-24 USER'S GROUP MEETING

The minutes of this meeting are on the following pages.

MEMORANDUM

REC'D OCT 8 1976

TO: 

DATE : September 29, 1976

FROM: Ernest E. Polley 
Coordinator
Office of Planning and Research

SUBJECT: Telecommunications Users
Group Meeting
September 23-24, 1976

This meeting represented the last meeting of the user's group prior to the submittal of the rough draft of the telecommunications proposal to the National Institute of Education. Depending on the outcome of a meeting with NIE on November 15, another meeting of the user's group may be called.

SUMMARY:

The meeting on the 23rd was of the group of the whole and was for the purposes of review of several of the important sections of the rough draft. The meeting on the 24th was for those people who would be most intimately involved in the intensive demonstration or pilot, i.e. representatives from the districts in the Bristol Bay Region.

In general all people present at the meeting seem to feel that the project was worthwhile and that we should proceed with the submittal of the rough proposal as scheduled. There was quite a bit of dialogue during the meeting, all of which was valuable in terms of enhancing the quality of the proposal. The RCA and University of Alaska representatives were appreciated for the demonstration of a terminal, similar to those which will be placed throughout the State. Bob Walp, of the Governor's Office of Telecommunications is equally appreciated for the interesting video tapes describing a video-based educational program available thru the University of Saskatchewan.

SPECIFIC RECOMMENDATIONS AND COMMENTS:

- 1) Mr. Arundel of NIE confirmed that instructional radio via satellite would be more than acceptable as a project component.
- 2) Elaine Mitchell, a Commissioner on Alaska Public Broadcast Commission, mentioned that the APBC currently has eight stations on line with two more coming up in the near future. Mrs. Mitchell strongly endorsed the concept of an inter-connected network for the delivery of instructional radio.
- 3) Jim Reed (principals association) mentioned that we needed to identify in the proposal, most specifically, the issue of whether or not materials development will focus on the reinforcement of classroom instruction or initial instruction.

4) Several people at the meeting felt that it was important to emphasize that the SMERC-Connect in San Mateo is primarily important because of SMERC's large instructional materials inventory. There seems to be a consistent and erroneous impression that the information dissemination system will focus on administrative and research data.

5) It was recognized by the chair, and several of the other members of the group, that the use of facsimile for materials transmissions is somewhat unsatisfactory from a technological standpoint. Unfortunately, this appears to be the only solution for the moment. Mr. Arundel pointed out that he has heard that the Pitney-Bowes Corporation is in the process of developing a facsimile copier which will transmit up to twelve pages per second. In relation to this, Mr. Arundel also pointed out that we might consider the project as having a potential for limited field trial and research on new innovations in communications technology.

6) Jennifer Wilke remarked that the implementation strategy in the intensive area must involve a communications link which field user's could use to gain immediate relief and answers to local problems and questions..

7) A considerable amount of discussion was spent on the adequacy of the management and information transmission diagrams. In the case of the latter, it was felt that the information systems diagram should put the emphasis on the aquisition and utilization of information, not on the communications circuit per se. It was also felt that the management diagram did not fully reveal the fact that regional resource centers and the implementation contractor would be controlled by a combination of user needs and user policy.

8) A good deal of extremely worthwhile dialogue occurred concerning the necessity for expanding and making quite implicit those sections of the proposal which refer to the management and support of instruction as compared to internal administrative requirements. In the case of the latter it needs to be established, for the naive reader, that efficient administrative processes are critical to the support of classroom operations.

September 24th Meeting:

1) At the completion of the day on September 24th the four superintendents gave interim approval to the project; with the understanding that final approval is contingent upon local board response to the proposal and a satisfactory project design in terms of tasks, management, and governance. Of particular concern is the nature of the relationship between the regional resource center and the design and implementation contractor.

2) It was felt that the priority for instructional program development should be the ninth and tenth grade curriculum.. This decision is based on the fact that ninth and tenth grade education will be occurring at a variety of locations with the eleventh and twelfth grade being offered primarily in Dillingham and Naknek. Therefore, it will be critical that

September 29, 1976

the eleventh and twelfth graders have a similar educational experience in terms of the first two years of high school. The four districts are currently working on some common approaches to curriculum.

3) In two-thirds of the schools in the intensive pilot region, internal space for hardware and operations will be a problem. It was determined that it will be necessary to budget a practical amount of money for minor remodeling and modifications. Proposal designers are to supply each superintendent with a general schematic showing the physical space requirements and locations for the the equipment to be placed in village schools.

4) It will be necessary that the budget contain a minimal necessary amount for the purchase of storage cabinets at each sight.

5) It was indicated that Pedro Bay and Ivanof Bay schools have been closed with an indication that Ivanof might re-open next year. A new school has been opened this year at Port Allsworth (Lake Clark).

6) There was a general agreement that the staff located within the regional resource center (those serving as village/project interface facilitators) need to be under the direct control and governance of the director of the center. At the same time, it will be necessary for the design and implementation contractor to have someone on site for joint problem solving, planning, and the facilitation of the contractors schedule of work.

E.P.

Enclosures

TELECOMMUNICATIONS USER'S GROUP MEETING
SEPTEMBER 23, 1976

<u>Name</u>	<u>Representing</u>
Sue Pittman (for Toni Jones)	REA - U of A
Tom Olson	NWREL - Portland, Oregon
Ron Bedard	DOE - Juneau
Dick Luther	DOE - Juneau
Kay Rosier	St. Lil (DOE) - Juneau
Chottie Angst	DOE - Juneau
Jim Nelson	DOE - Juneau
Peggy Cummings	State Library - Juneau
Jennie Riggen	State Library
Marcia Freer	Adult Basic Edu. - DOE
Dave Eide	DOE - OPR
Wanda J. Cooksey	DOE - C/S
Bob Cooksey	NEA - Alaska
Tom Monk	FST - DOE
Dale Lunsford	Bristol Bay Borough Schools
Bob Walp	Office of Telecommunications
Frank Spargo	U of A - Southeast Campus Computer Center
R. Hansford	REA
Kevin Arundel	NIE
Herb Oba, Supt.	Dillingham REA
Charles R. White, Supt.	Lake & Peninsula Schools
Elaine Mutchess	A.P.B.C. - KTOO Radio
J. Wilke	DOE/GOT
Paul Gulyas	DOE/Post Secondary Educ.
Clark Jones	DOE/ABE
Gerald Hiley	DOE/Manpower
Robert A. Lehman	DOE/OPR
William Bramble	U of K - (NWREL)
David Dickerson, Supt.	Southwest Region Schools
Dick Wells	RCA
Jim Reed (for Bob Weiss)	Principals Association
John Coffee	Assoc. of School Admin.

TELECOMMUNICATIONS USER'S GROUP MEETING
SEPTEMBER 24, 1976

Ernest E. Polley	DOE/OPR
Bill Bramble	University of Kentucky
Tom Olsen	NWREL
Kevin Arundel	NIE
Herb Oba, Supt.	Dillingham REA
Charles White, Supt.	Lake & Peninsula Schools
David Dickerson, Supt.	Southwest Region Schools
Dick Wells	RCA